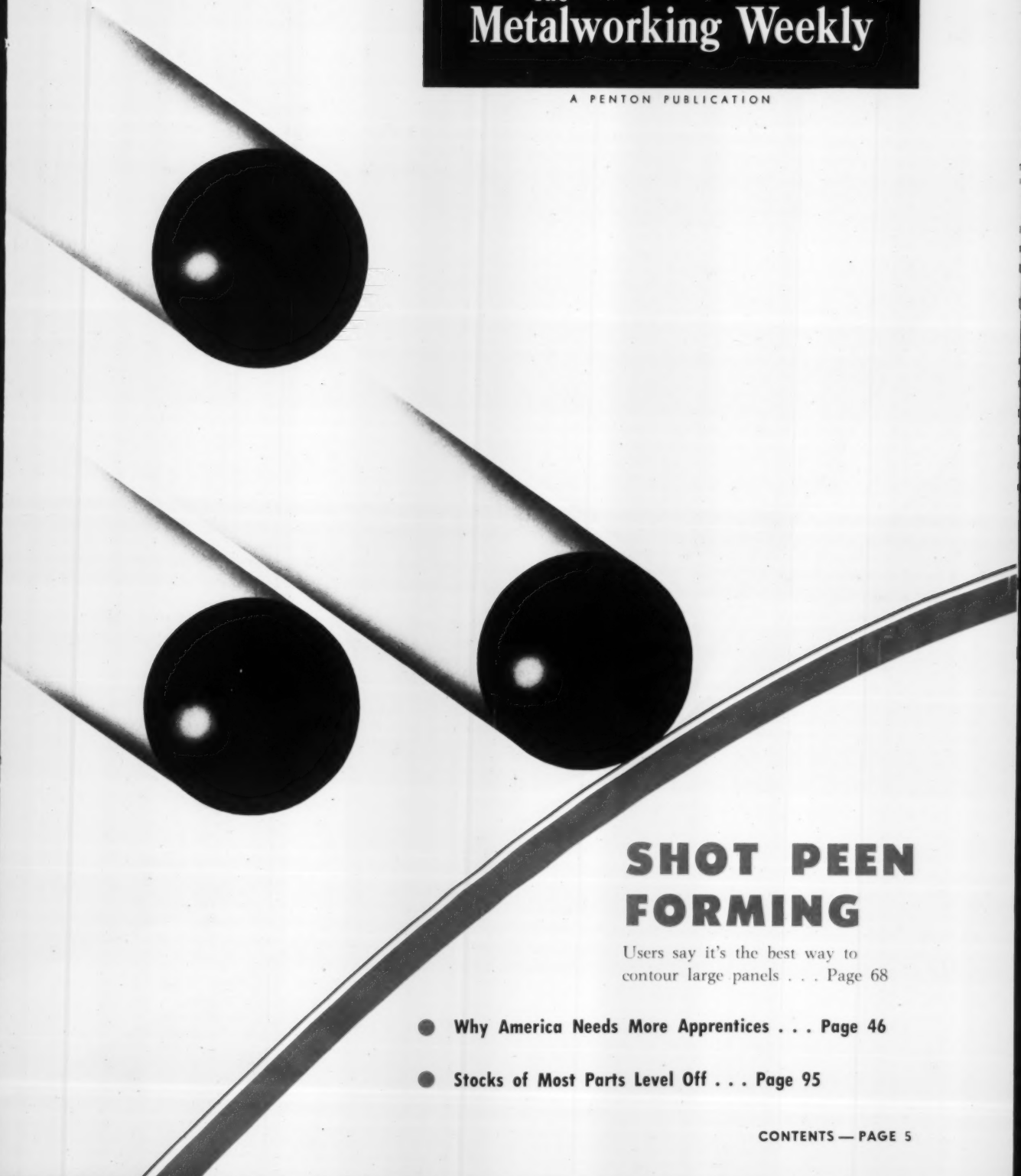
JULY 7, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



SHOT PEEN FORMING

Users say it's the best way to contour large panels . . . Page 68

- **Why America Needs More Apprentices . . . Page 46**
- **Stocks of Most Parts Level Off . . . Page 95**

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2 New Bolted LIFTING MAGNETS by EC&M

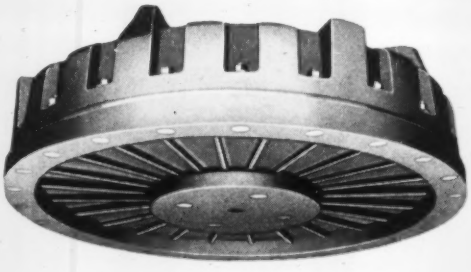
57" AND 66" DIAMETERS

New throughout, these EC&M **Type SB Lifting Magnets** have many improvements over previous-design bolted magnets. They are mechanically stronger, have improved coil construction, and high lifting capacity due to a better magnetic path. Tapered-head, through bolts simplify field replacement of worn pole shoes... permit quick access to coil.

Strap aluminum coil winding is firmly anchored by top-plate held by bolts and screws. Continuous welds seal coil spool in magnet case and make it water-tight. Welds are easily ground or chipped off for field removal of coil.

Coil-leads terminate in separate chambers, 180° apart. The magnet is freed of moisture and completely filled, through these two chambers, with self-polymerizing, insulating compound.

Chains, the same as used on large EC&M ALL-WELDED Magnets, are of 3-leg design with links of cast manganese steel terminating in a forged crane link for easy hook-on.



EC&M BOLTED MAGNETS complement the complete line of EC&M ALL-WELDED Magnets • For all the facts, Write for Bulletin 1300 SB

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

9251

Spring wire puts new life in old tires

Old tires begin a whole new life as raw material for durable, resilient doormats. And Bethlehem galvanized spring wire plays an important role.

First, the casing is slit into strips ⅛ in. wide and these in turn are chopped into blocks 2½ in. long. A ¼-in. hole is punched through each end of the rubber blocks, which are then strung over lengths of Bethlehem hot-dip galvanized spring wire bent into a block U-shape.

When the mat has been woven to desired size, it is compressed and the free ends of the wire are trimmed, closed, and finished off with a small ferrule. A mat like this will withstand years and years of constant scuffing, jerking, twisting—thanks in good measure to the sinewy toughness of Bethlehem spring wire and its moisture- and abrasion-resisting coating of zinc.

Spring wire is only one of the many specialties that Bethlehem produces regularly in its modern wire mills. Each kind of Bethlehem wire has the right strength, ductility, finish, and other properties required to give best results for a specific application. A Bethlehem representative would be glad to talk over your wire needs with you. Just get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

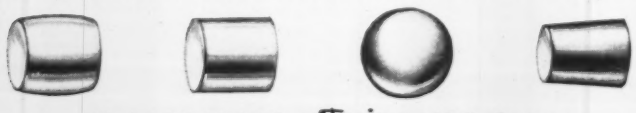
creative designing calls for an open mind

Leonardo Da Vinci's design for a pump using the Archimedian screw principle

Model courtesy of IBM

EVEN DA VINCI'S DESIGN FOR A PUMP COULD HAVE BEEN BETTER WITH HELP FROM AN SKF ENGINEER.

An SKF engineer never tends to favor one or two types of bearings in his recommendations. That's because SKF makes all four types of ball and roller bearings in over 3,000 sizes. This gives our engineers the kind of flexibility they need to keep an open mind on any bearings problem. Give your problem to us and see. 7822



Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

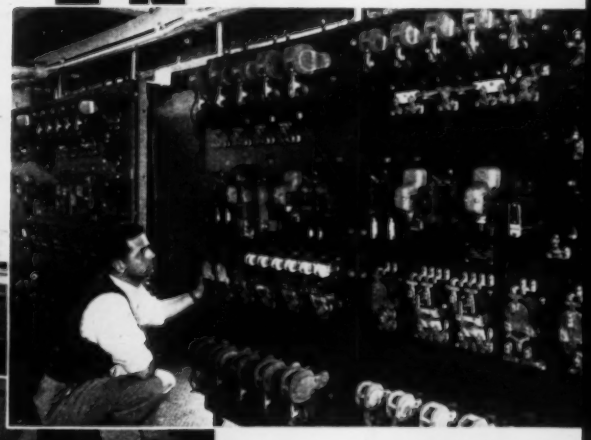
SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

®REG. U. S. PAT. OFF.

Clark-controlled gantry unloader, capable of handling 300 tons of bulk material per hour from ship hold to conveyor hoppers.

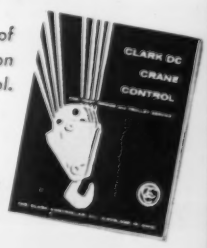
Clark Control panel for hoist, bucket, bridge and trolley motions.



Look to CLARK for safe, high-efficiency low maintenance CRANE CONTROL

Clark designs and builds control specifically to meet the basic requirements of crane operation: safety, smoothness, efficiency, low maintenance and long life. As a major supplier of all types of engineered heavy-duty industrial control for over 30 years, The Clark Controller Company has pioneered and developed many of the advancements in modern crane control. Among these, for dc cranes, are a proven-dependable dynamic-lowering circuit for the hoist and an exclusive plugging relay design for greater motor protection when reversing bridge or trolley motions. Also outstanding in Clark dc crane controls, are the exclusive "Vari-Time" relays and contactors with built-in, hermetically-sealed adjustable time-delay elements that never require maintenance or repair, and are "guaranteed for the life of the controller".

Write for your copy of this informative book on Clark DC Crane Control.



The **CLARK CONTROLLER** *Company*

Everything Under Control

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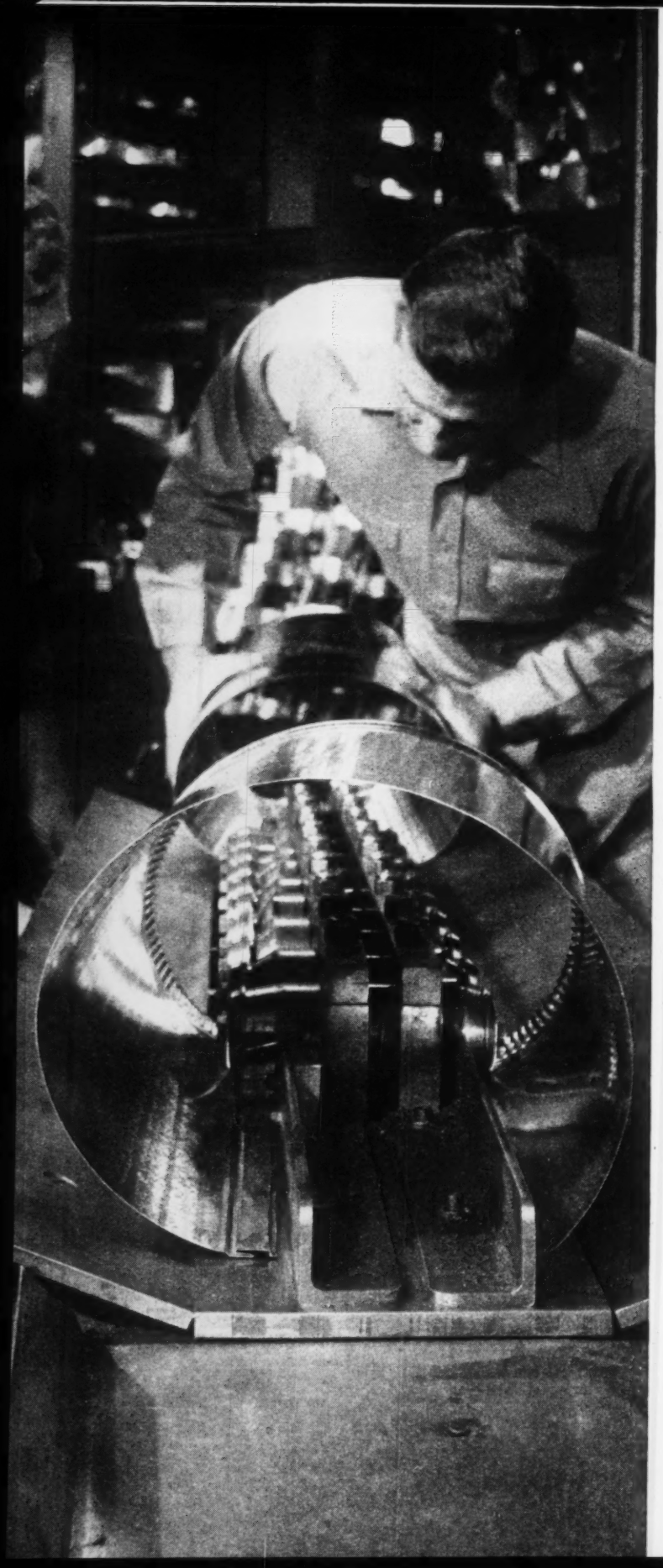

"We just don't worry about chipping or flaking when we lock-seam WEIRKOTE®!"

If those difficult lock-seaming operations give you trouble, it's time to take the step that fabricator after fabricator is taking.

Switch to Weirkote zinc-coated steel as promptly as you can.

Weirkote's continuous process integrates the zinc and the steel so that the most complicated forming operations are made without chipping or flaking. Weirkote can be worked to the very limits of the steel itself—spinning, deep drawing, crimping, heading, twisting, the works. Comes through in perfect shape to give your products lasting anti-rust protection, such as they've never had before.

Can you think of a quicker, easier step to an even better product? To fewer rejects? To more peace of mind? To lower costs? And, perhaps most important, to the greater good will of customers who receive even more value for their money?

Write today for the free booklet that will give you lots of food for thought on the many advantages Weirkote can bring to your products and production. And *now* Weirkote is treated to inhibit wet storage (white oxide) stain. Weirton Steel Company, Dept. B-1, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

This Week in STEEL The Metalworking Weekly

July 7, 1958
Vol. 143 No. 1

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Is this Russia's weakness: Forcing its people to replace religion with science and Leninism?

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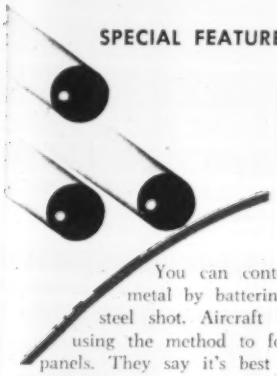

You can contour sheet metal by battering it with steel shot. Aircraft firms are using the method to form wing panels. They say it's best way. An added benefit: Better fatigue strength.

WINDOWS OF WASHINGTON 42

Mineral-minded senators, attempting to set up five-year program, want executive branch to bypass Congress.

MIRRORS OF MOTORDOM 49

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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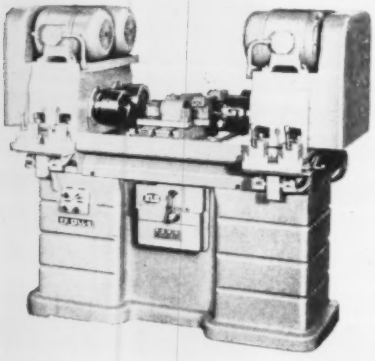
Only One Machine But Six Operations



STANDARD EX-CELL-O PRECISION BORING MACHINES lower costs, increase profits, yet every one of 8 models takes these jobs in stride: • BORING at today's production speeds, maintaining extremely close tolerances • TURNING with a minimum of tooling • FACING with standard facing heads or standard cross slides • COUNTER-BORING taken in stride—rugged spindles support multi-diameter bars • CHAMFERING—plunge or feed face • GROOVING with table or standard cross slides.

Clean, smooth, *precision* operations at lower costs—call your Ex-Cell-O Representative or write Ex-Cell-O, Detroit.

57-87

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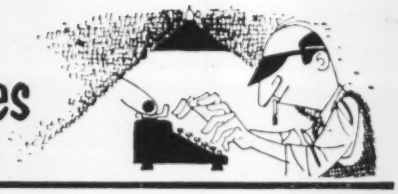
EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

behind the scenes



Helping To Help Each Other

Many years ago in the city of Alexandria, while Britons were still painting themselves blue, and all Gaul was a single part, the lame, the halt, and the blind used to gather in the open market place to exhibit their infirmities and discuss cures. Because man is mortal, he tends to come apart at the seams before half his days. Medical men of antiquity recognized this, but they were often puzzled.

In the free exchange of comment much useful information was acquired. Folks with tired blood, sluggish intestines, nagging backache, and an overabundance of stomach acids told each other what they had done for themselves, and hope was born again. Each day, through public confession, they learned about new treatments for old ills. Best of all, they saw clinical proof of improvement.

Admittedly it is a long stretch between ancient Alexandria and this week's STEEL, but in support of the connection we would like to introduce as evidence the article beginning on Page 66. It represents the preliminary twinkle in a shower of ideas contributed by readers on how to beat the Cost Crisis. STEEL's Cost Crisis Contest is a modern day clinical Alexandria: Metalworking men confess what they have done to cut costs and increase production through the use of new equipment, and their revelations are broadcast through STEEL.

The editors believe that this cross-pollination of ideas will benefit the metalworking industry. Each Monday for 26 weeks a different article will appear; from them metalworking will learn about new treatment for old ills. Best of all, each article will establish clinical proof of improvement.

Catching Editors in Stride

Our editors have been coming and going in such great jumps lately we have been hard put to keep track of them. How would you explain an expression like "hard put" to a Bulgarian? Or a Siberian? Come to think of it, Editor-in-Chief Irwin Such was over in Siberia a few weeks ago (see story, Page 40), but he didn't try to explain anything to the natives, mostly on account of they were trying to explain things to him, such as "Eh! Zdyes svegda ochin holodna, grazhdanyin!" which is an approximation of "What the hell, Mac, it's always cold here!"

Shortly after Irwin touched down in Cleveland, Editor Walt Campbell touched down in Paris, accompanied by writers representing *Look*, *Mechanix Illustrated*, and the *Christian Science Monitor*. The editorial junta had been invited to inspect the highly automated Renault plants, prime sources of European automobiles, steel, railway cars, trucks, and buses, and Walt was nervous. He felt that his French was inadequate to cope with a highly technical exchange.

His nervousness fled, however, when he was introduced to M. Pierre Besier, head engineer at Regie Renault. "Bienvenu, M'sieu Cam'ELL!" cried Monsieur Besier. "I know you! I know you from ze photograph, n'est-ce pas?" With the words, he whipped out a copy of STEEL from his desk, flipped it open to the editorial page, pointed dramatically at the 7½-pica reproduction of Campbell's relaxed features, and exclaimed "Regardez!"

The moral is, if you work for STEEL, why bother with a passport?

Contemplation Dept.

We include this item for what it is worth. On May 16, 1928, a stocky, pock-marked man addressed a large gathering of young people. "In order to build," he said, "we must know; we must have mastered science, and to know we must study. We must study persistently and patiently. We must learn from everybody, both from our enemies and our friends, but especially from our enemies. We must study with clenched teeth and not be afraid that the enemy will jeer at us, at our ignorance and our backwardness. Dilettantism and universalism are now fetters on our ankles. What we need are specialists in metals, textiles, fuel, chemistry, agriculture, transport, trade, and so on. The task is to hammer out new forces of specialists in all branches of knowledge, to learn, learn, and learn in the most stubborn fashion."

The speaker was Joe Stalin. The group was the Eighth All-Union Congress of the Leninist Young Communist League of the Soviet Union. What are all those kids doing now? Just shooting up sputniks, bracketing the moon, and perhaps leaving the rest of the world in their scientific dust, that's all.

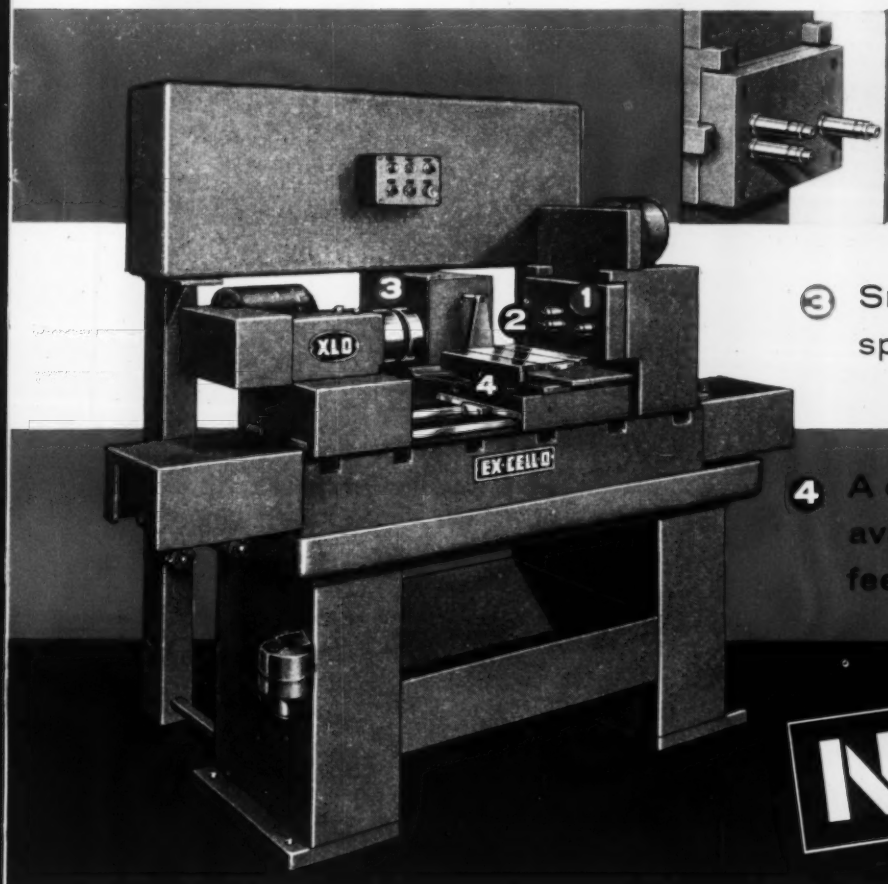
5 Touch 1, & Vice Versa

The Book of Esther, of course, is the only book in the Bible that doesn't contain the words God or Lord. Everybody seemed to know about it, too, which indicates that STEEL readers are a pretty high class lot. We wonder if some of them could deviate for a while and ponder this one: Six cigarets must be arranged in such a way that each cigaret must touch five others, and remain in contact. We'll be looking for your diagrams.

Shrdlu

(Metalworking Outlook—Page 29)

1 New Micro Spindles are as small as 3/4" dia.
...Precision Bore holes as small as 1/16"



2 Bores multiple holes at close center distances

3 Small conventional spindles can be used

4 A cross slide is available for grooving, feed facing, or indexing

NEW!

58-41

For Precision Boring of Small Components

New Ex-Cell-O Machines designed for production boring, turning, grooving, recessing, facing, counterboring and chamfering of instruments, missile parts, other precision applications.

These two new Ex-Cell-O machines put *precision* boring of aircraft, missile and automotive parts, instruments and other exacting components on a low-unit-cost production basis.

Precision-built midget spindles permit close center-distance boring and facing. Multiple holes as small as 1/16-inch can be bored with remarkable accuracy; and for maximum versatility, small conventional Ex-Cell-O Precision Spindles can also be used when required.

Compact Style 711 (single-end) and Style 712 (double-end) Precision Boring Machines have hardened and ground ways, pushbutton control, pneumatic-hydraulic table and feed control.

Optional equipment includes a mist coolant system and cross slide attachment for grooving, feed facing or indexing.

See your local Ex-Cell-O Representative or write direct.

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DETROIT 32, MICHIGAN
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CAST SO ACCURATELY

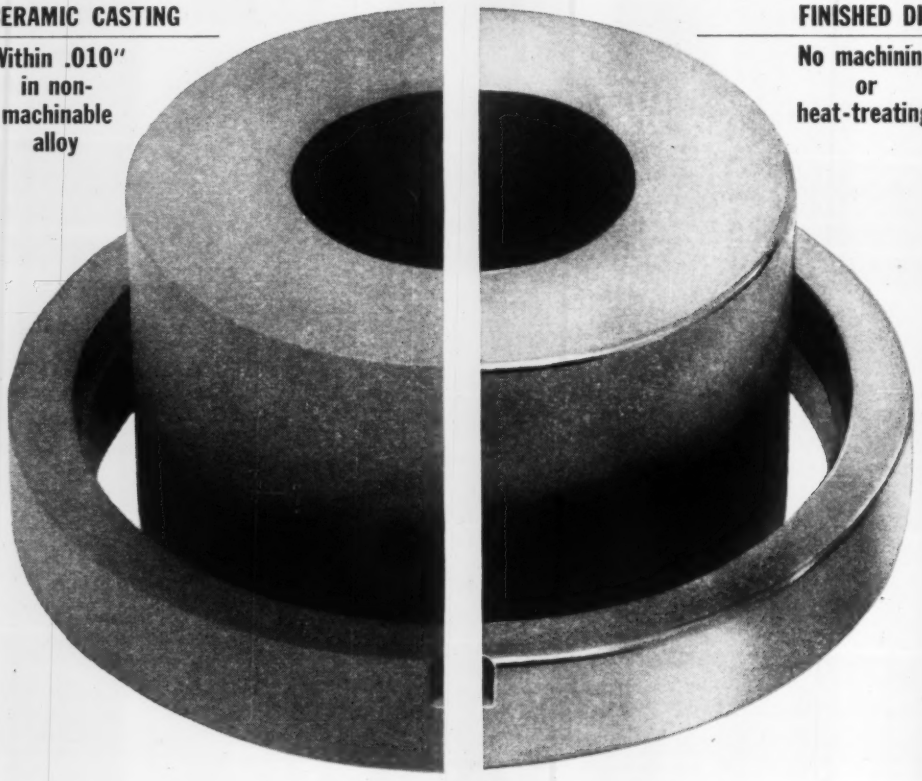
these super-alloy extrusion dies need only finish grinding

CERAMIC CASTING

Within .010" in non-machinable alloy

FINISHED DIE

No machining or heat-treating



ANOTHER CURMET PROCESS

Replacing costly forged dies, *cast* extrusion dies like the one illustrated are produced from ceramic molds by Metals Processing Division of Curtiss-Wright *within .010" of finish dimensions*, requiring only finish grinding. Machining and heat-treating are eliminated. Non-machinable alloys of extra hardness can now be used, extending die life.

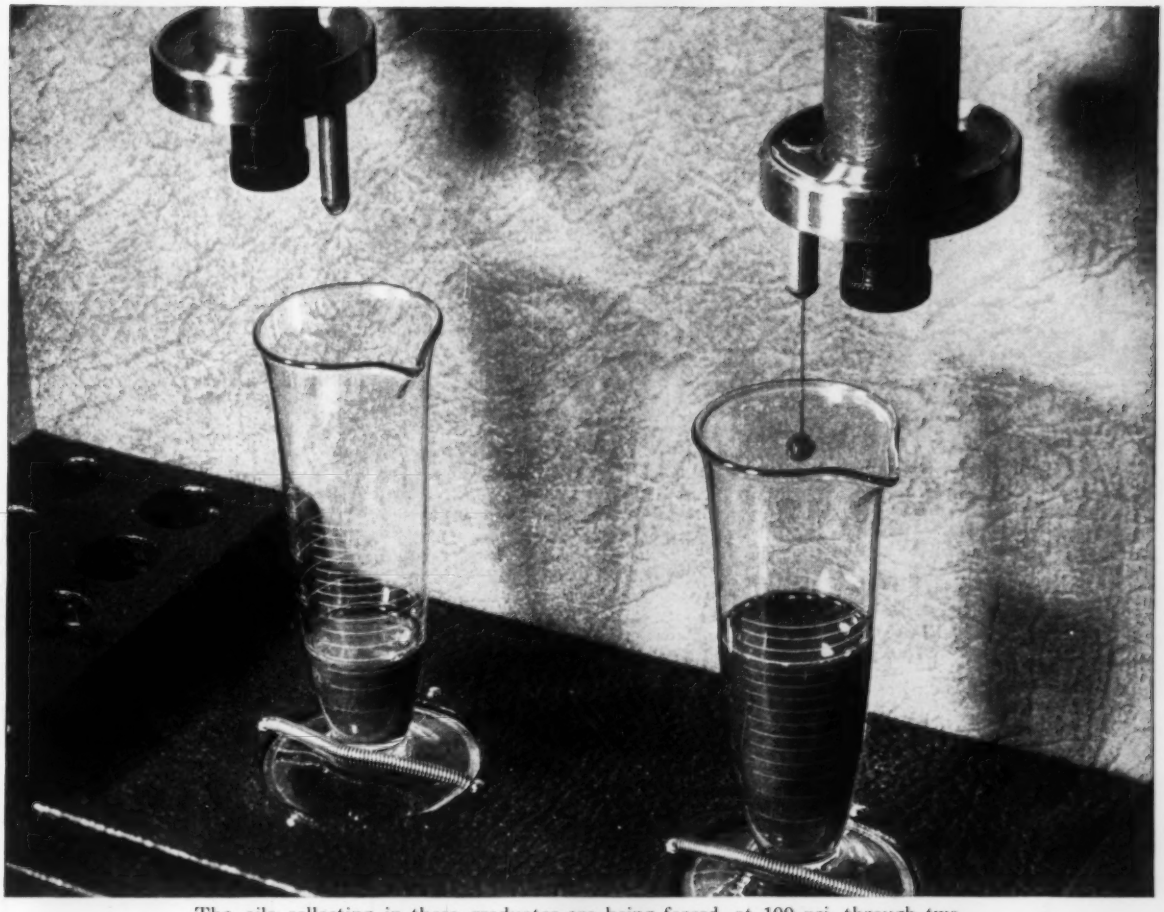
The same ceramic casting process brings similar savings and improved performance to users of forging, hammer and press dies, as well as pressure casting and other types.

Curtiss-Wright MPD Division is widely experienced in casting heat-, corrosion-, and abrasion-resisting ferrous alloys by sand, centrifugal and shell methods.

FOR FULL INFORMATION, WRITE TO:

METALS PROCESSING DIVISION
760 Northland Avenue

CURTISS-WRIGHT CORPORATION
Buffalo 15, New York



The oils collecting in these graduates are being forced, at 100 psi, through two sintered bronze bearings. Although each oil has the same viscosity, the Suntac on the left is leaking *only one quarter as much as* the straight oil on the right.

Desk-top demonstration proves that SUNTAC HYDRAULIC OILS can cut your oil losses . . . up to 75%

Suntac® oils are competitive in price, competitive in quality, *and unique in their ability to reduce oil leakage without costly shutdowns.*

Suntac oils are high-quality, exceptionally stable mineral oils especially compounded to reduce leakage. Experience proves that they give longer pump and seal life with higher overall operating efficiency.

See for yourself how a Suntac oil can cut your oil costs. A simple desk-top demonstration will show you how.

Ask your Sun man to show you how others have reduced oil consumption, or write to Dept. S-7.

Industrial Products Department

SUN OIL COMPANY, Phila. 3, Pa.

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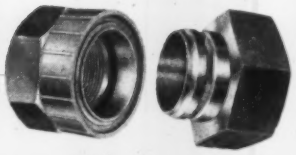
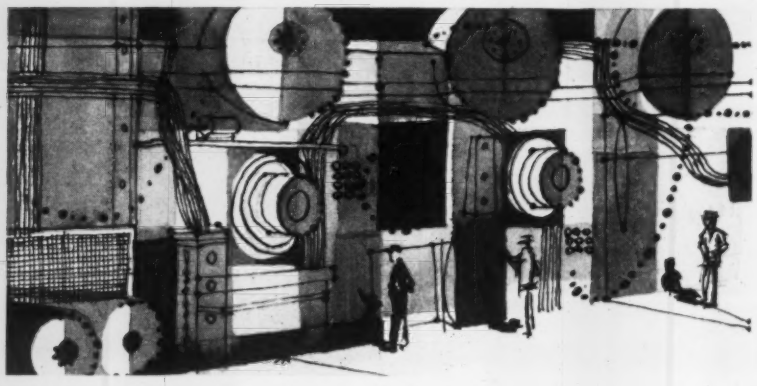
INDUSTRIAL COUPLINGS

OPEN COUPLINGS





COMPARE . . . TEST . . .
THEN USE THE BEST

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- Ease of Operation
- Positive Lock
- Increased Efficiency
- Minimum Maintenance
- Maximum Efficiency
- Rugged Construction

. . . all adding up to "down-time" cut in half and production schedules met with half the effort.

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With every roll change . . . the nation's steel, tin, aluminum, paper and allied mills are saving up to 60 man-minutes with every roll change . . . a saving of thousands of dollars made possible with Roylyn Industrial Couplings!

Wherever hose connections are made, they can be connected or disconnected faster and easier with Roylyn "Quick" Couplings . . . FOLLOW THE LEADERS OF INDUSTRY FOR THE BEST CONNECTIONS IN THE WORLD!

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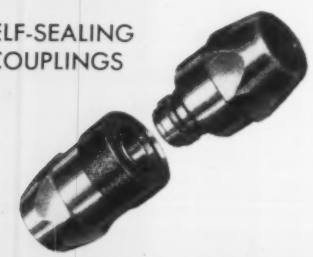

The Best Connections in the World

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LETTERS TO THE EDITORS

Tax Rate Change Is Needed

You have done an excellent job in attempting to bring about certain basic changes in our depreciation and tax rates which would help the suffering machine tool industry.

We read frequent reports from all sides, since everyone seems to be concerned with the machine tool industry's problem, excepting those politicians who do not see fit to make those basic changes which are so necessary for immediate improvement.

While there has been some business activity this year, certainly it is far from what we would expect it to be, and signs for the immediate future are not good.

On the other hand, there are some programs coming up. There seems to be some feeling that many of the quotations we are now making will develop into business by the end of this year.

Roland Lehr
President
Baker Bros. Inc.
Toledo, Ohio

Creative Thinking Stirs Request

May we have permission to reprint the article, "How To Sell Ideas to Bosses" (Apr. 7, Page 71)? We would like to reproduce about 200 copies for distribution to those of our management personnel who are participating in a creative thinking program.

Robert J. Simonds
Education & Training Dept.
Aluminum Co. of America
Pittsburgh

• *Permission granted*

Reprints to Silicon Steel User

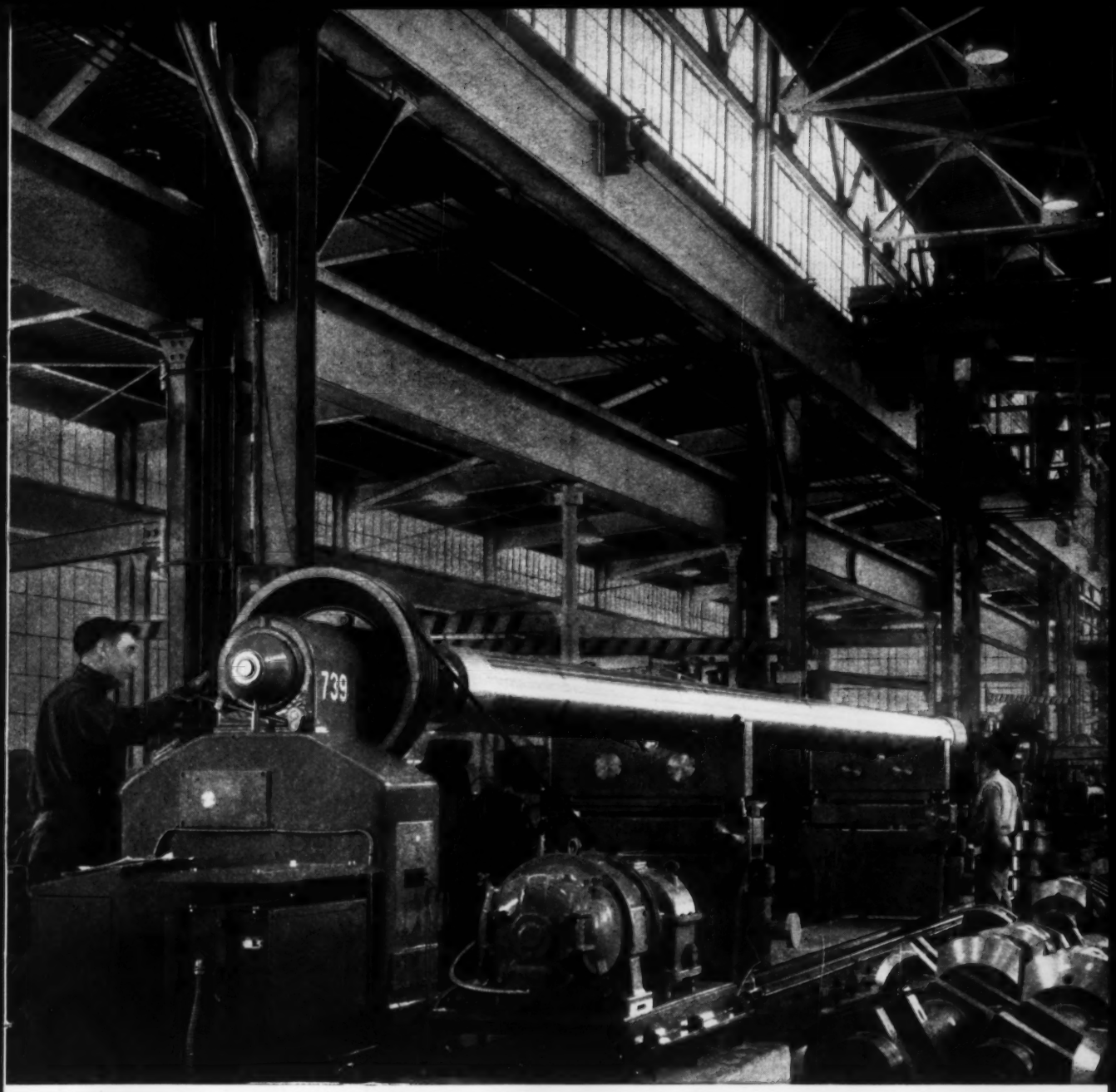
Please send ten reprints of the article, "Electrical Steels: How To Choose and Improve Them" (June 9, Page 116). Because we are a major user of silicon steels, I believe that these reprints will be of high interest and usefulness to our entire organization.

John Enander
Director of Manufacturing
Advance Transformer Co.
Chicago

. . .

We would appreciate a copy of this article. The reprints you provide are

(Please turn to Page 12)



WHO FORGES THE TOUGH ONES?
and dynamic balances them, too?

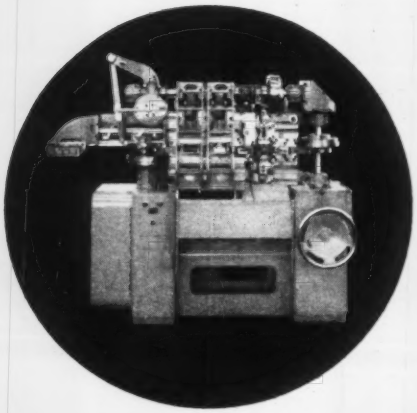
To further National Forge's reputation for producing precise forgings, we've installed one of the largest, most accurate dynamic balancing machines in use. Our American-Trebel has a 33,000-pound, 60-foot capacity.

Pictured on the machine is a 42 ft. propeller shaft that has been forged, machined, and hollow bored—all operations done in our National Forge plant. NFO specialists are shown balancing this 15,500 lb. shaft to within 730 ounce-inches in two planes.

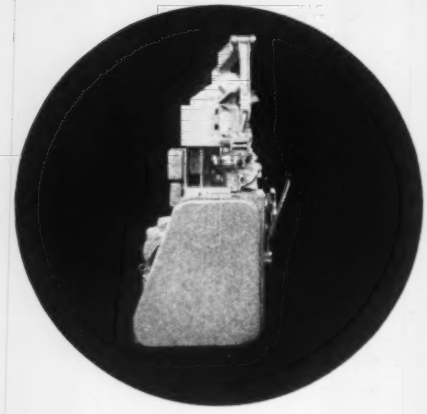
If you want one responsible source to produce and control the quality of your forgings . . . from melting and forging the steel through machining and dynamic balancing . . . call National Forge. Let us quote on your next job—and *prove* "who forges and dynamic balances the tough ones . . . best!"

NATIONAL FORGE & ORDNANCE COMPANY
IRVINE, WARREN COUNTY, PA.

For information on the "tough" ones and the machinery that makes them best, write for Bulletin NFO3.



VERTICALITY = SETUP TIME / 2



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LETTERS

(Concluded from Page 10)

of great service to us, and we often retain them in our technical files.

A. F. Mohri
Chief Metallurgist
Steel Co. of Canada Ltd.
Hamilton, Ont.

Request from Overseas

I would appreciate an extra copy of the article, "Balance of Steel Power Shifts" (May 5, Page 92). It is interesting.

T. Otsuka
Manager-Technical Research Dept.
Steel Tube Works
Sumitomo Metal Industries Ltd.
Amagasaki, Japan

• • •

Please send an extra copy.

Harleston R. Wood
President
Alan Wood Steel Co.
Conshohocken, Pa.

Pricing Data to Office

We found the Program for Management article, "Pricing for Profit" (June 16, Page 87), interesting. May we obtain three reprints for distribution in our office?

Ralph W. Russell Jr.
Lawndale Forging & Tool Works
Chicago

• • •

I have read this article with considerable interest and congratulate you upon a splendid exposition of this subject which is not well understood in many places today. I would like 50 copies to distribute to others in our organization.

Bruce B. Gravitt
Manager-Marketing
Meter Dept.
General Electric Co.
Somersworth, N. H.

Depreciation Article Interesting

We would appreciate two copies of the article, "How To Reform Depreciation" (June 9, Page 65). We found it interesting.

C. A. Maennicke
New York Div.
Washburn Wire Co.
New York

Paste Solder Supplier

We are interested in the article, "Paste Solders Automate Assembly" (June 2, Page 68). We would appreciate knowing which organization supplied the solder dispensers and the paste solder.

A. E. Jacobs
Purchasing Agent
Emerald Mfg. Co.
Brooklyn, N. Y.

• *The equipment was engineered and installed by Fusion Engineering Co., 17921 Roseland Ave., Cleveland 12, Ohio. The firm also formulates the paste solder compounds. General manager is George N. Williams.*

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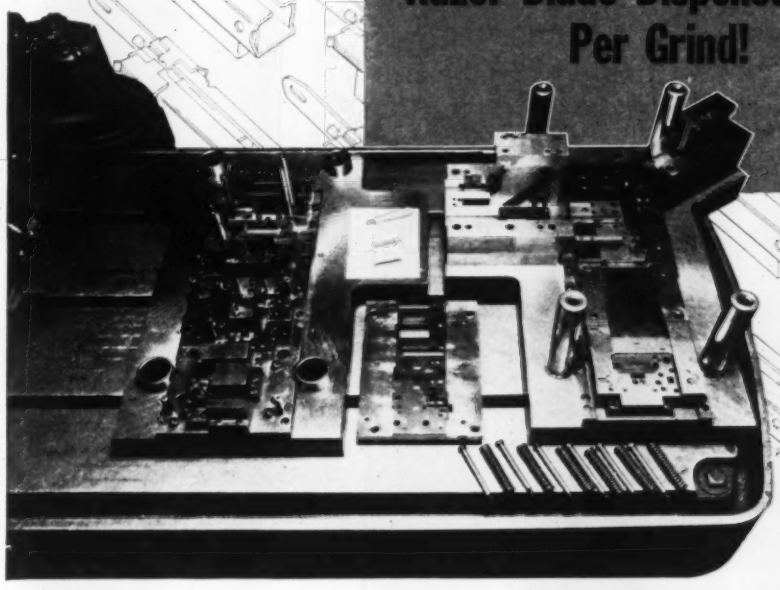

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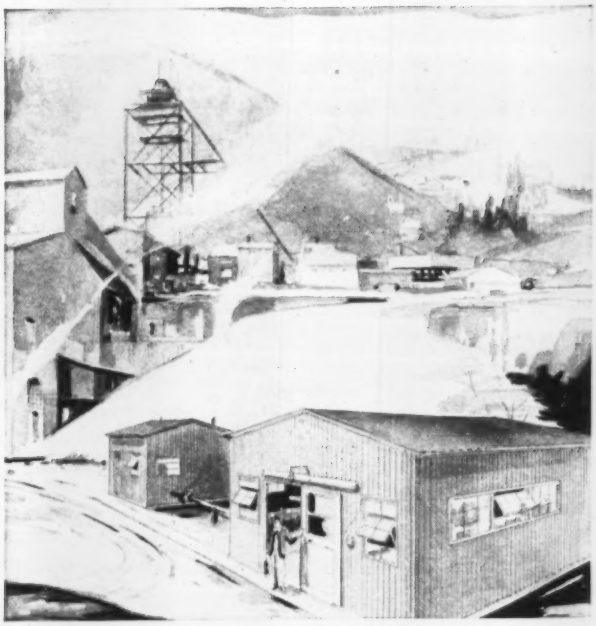

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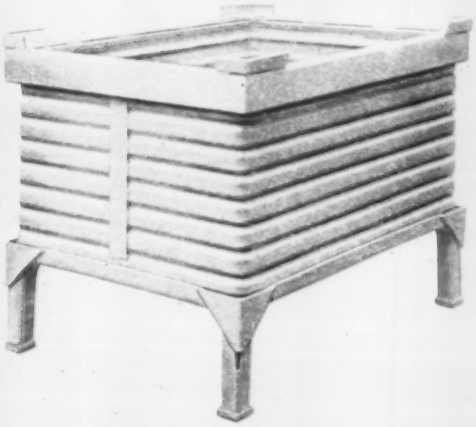

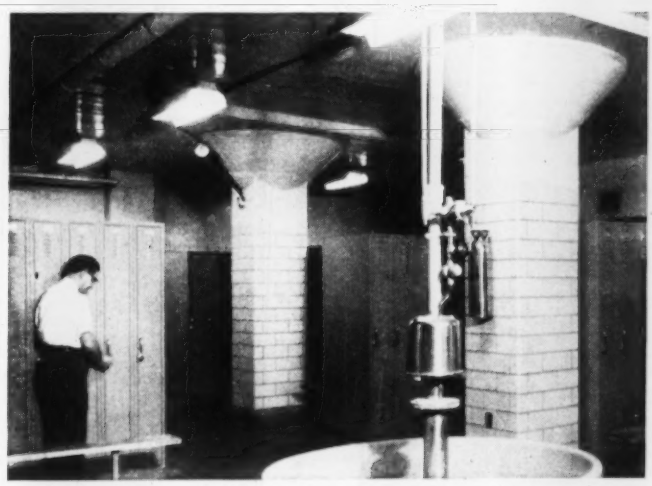

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1. Head Assembly is jig-welded for perfect alignment of the entire jib.

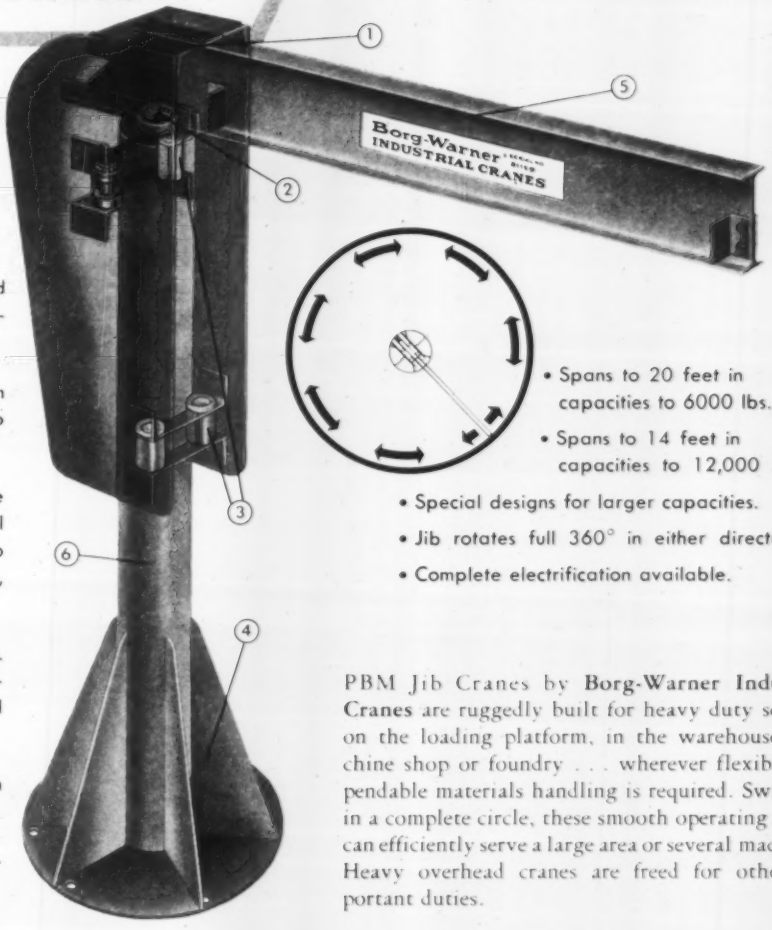
2. Head Assembly pivots on heavy ball thrust bearing at top of column.

3. Head Assembly has four large rollers which engage the vertical column. Each roller contains two precision ball bearings for smooth, easy jib rotation.

4. All welded steel construction. Six heavy gussets brace the completely self-supporting vertical column.

5. Jib Girder is made of high carbon steel.

6. Pillar is made of heavy seamless steel pipe.



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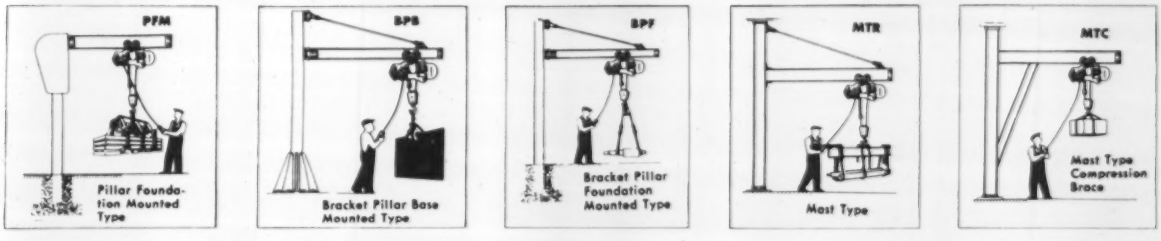
- Special designs for larger capacities.
- Jib rotates full 360° in either direction.
- Complete electrification available.

PBM Jib Cranes by **Borg-Warner Industrial Cranes** are ruggedly built for heavy duty service, on the loading platform, in the warehouse, machine shop or foundry . . . wherever flexible, dependable materials handling is required. Swinging in a complete circle, these smooth operating cranes can efficiently serve a large area or several machines. Heavy overhead cranes are freed for other important duties.



Borg-Warner Industrial Cranes makes 6 other types of Jib and many other models of Overhead Traveling Cranes to fill every need.

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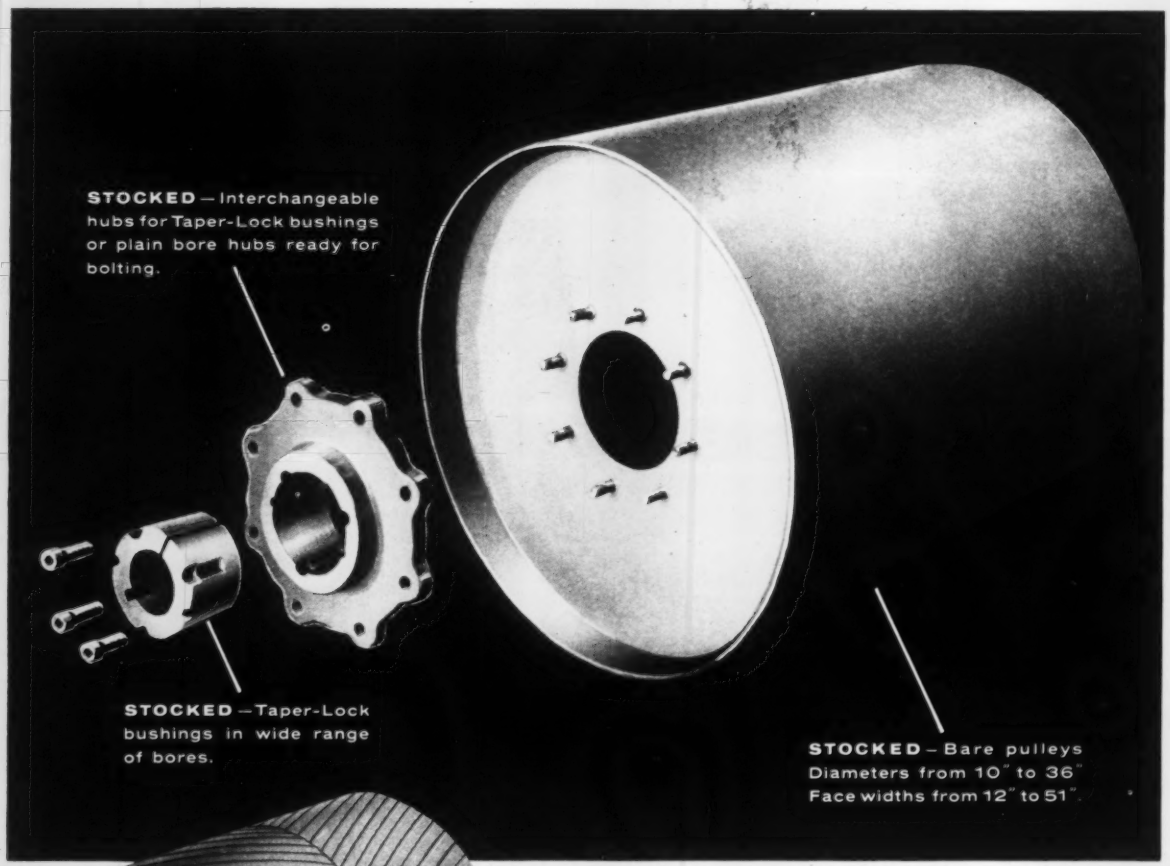
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STOCKED—Taper-Lock bushings in wide range of bores.
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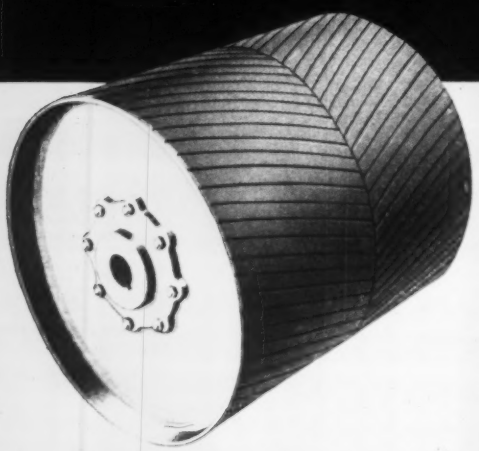

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July 23-26, National Tool & Die Manufacturers Association: Summer board meeting, Mt. Washington Hotel, Bretton Woods, N. H. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

Aug. 11-14, Society of Automotive Engineers: National west coast meeting, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 19-22, American Institute of Electrical Engineers: Pacific general meeting, Hotel Senator, Sacramento, Calif. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Aug. 19-22, Western Electronic Show & Convention: Pan-Pacific Auditorium, Los Angeles. Information: WESCON, 1435 S. LaCienega Blvd., Los Angeles 35, Calif.

Sept. 7-12, American Chemical Society: National chemical exposition and conference, International Amphitheatre, Chicago. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

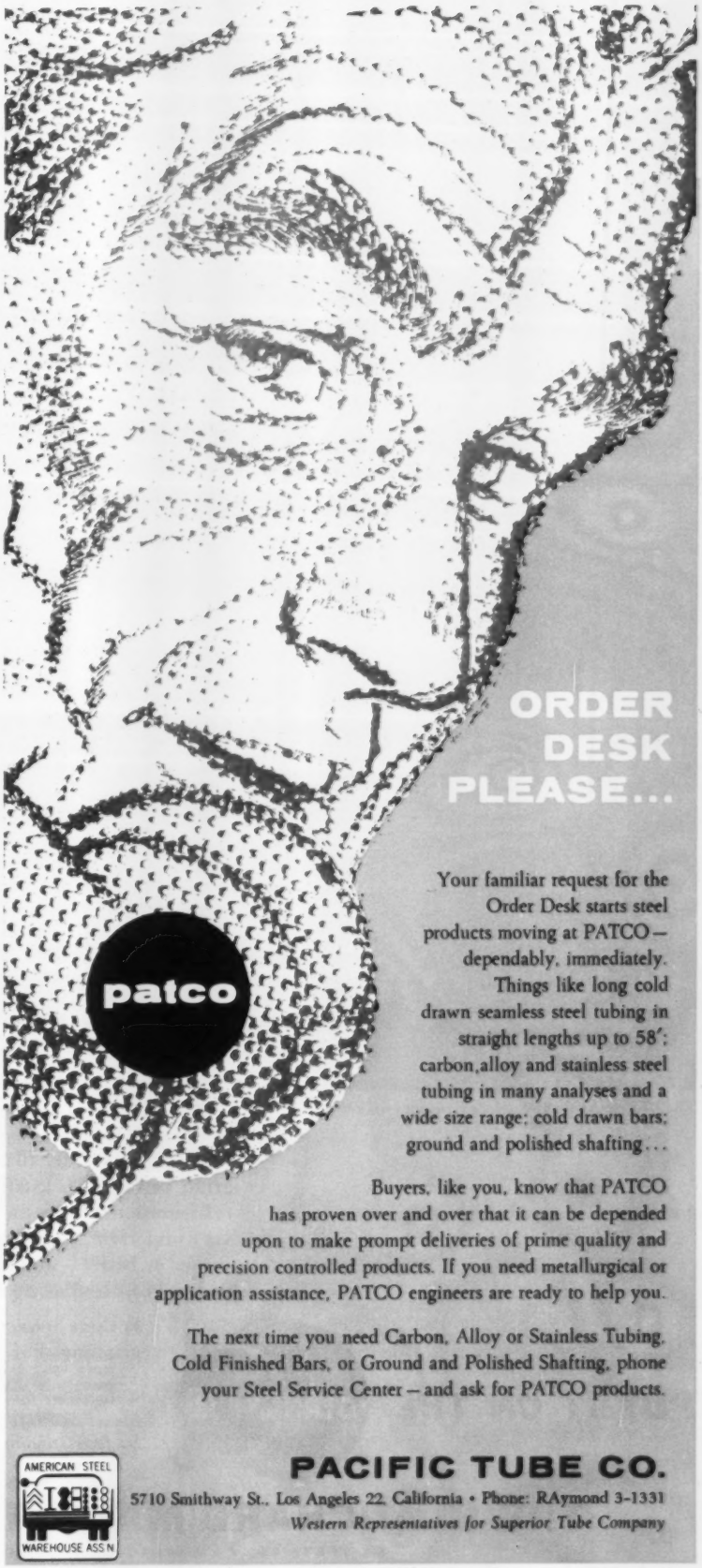
Sept. 8-11, Society of Automotive Engineers: Farm, construction, and industrial machinery meeting, production forum, and engineering display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 10-11, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 11-12, Refractories Institute: Fall meeting, Broadmoor Hotel, Colorado Springs, Colo. Institute's address: 1801 First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: Avery C. Newton.

Sept. 14-19, Instrument Society of America: Annual instrument-automation conference and exhibit, Convention Hall, Philadelphia. Society's address: 313 Sixth St., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 16-18, Electronic Industries Association: Fall meeting, St. Francis Hotel, San Francisco. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.



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The Blanchard No. 18 Surface Grinder puts a surface of 5 micro inches or better on Bendix-Westinghouse valves at the rate of 75 pieces an hour.

A Blanchard Model 18 Surface Grinder is used to finish grind valve plates used in Bendix-Westinghouse electric refrigeration compressors. They say: "This operation is very important, because—with a surface finish of five micro inches or better—we get a perfect seal on our gaskets and valves, eliminating the possibility of leakage."

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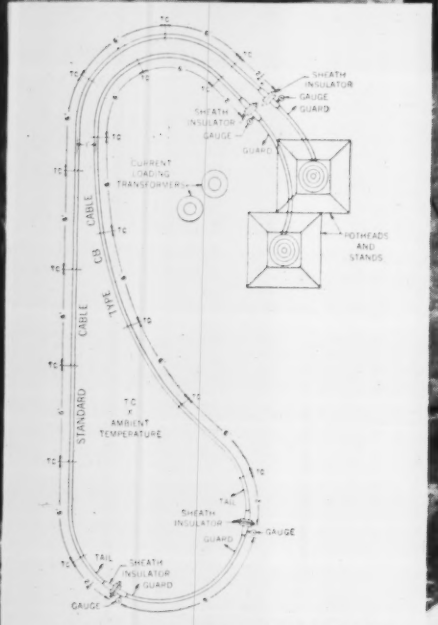
Cyclic aging test on paper-lead power cable reveals



RESEARCH LABORATORY SET-UP for cyclic aging test. Two single-conductor, 69kv shielded-type cables (one standard, one Anaconda Type CB) were spliced together to form a single cable. The cable was then subjected to cyclic aging for 404 daily load cycles. At end of test the two sections were studied—and revealed the results shown in chart at right.

Greater insulation stability...longer cable life with TYPE CB cable

Heat and electrical stress . . . heat and electrical stress—keep it up long enough and insulating oil in ordinary paper cable breaks down.

Anaconda Type CB* (Carbon Black) power cable is different. Special carbon-black tapes continually purify and stabilize the insulating oil over the life of the cable. These carbon-black tapes provide many advantages:

1. Oxidation products are removed.
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4. Destructive energy is reduced because the work function of carbon is much less than that of copper.
5. Surge currents are diminished.
6. Impulse strength is increased.
7. Dielectric strength and life are increased.

The over-all result is not only physical and electrical improvements, but also real economic gains for the user.

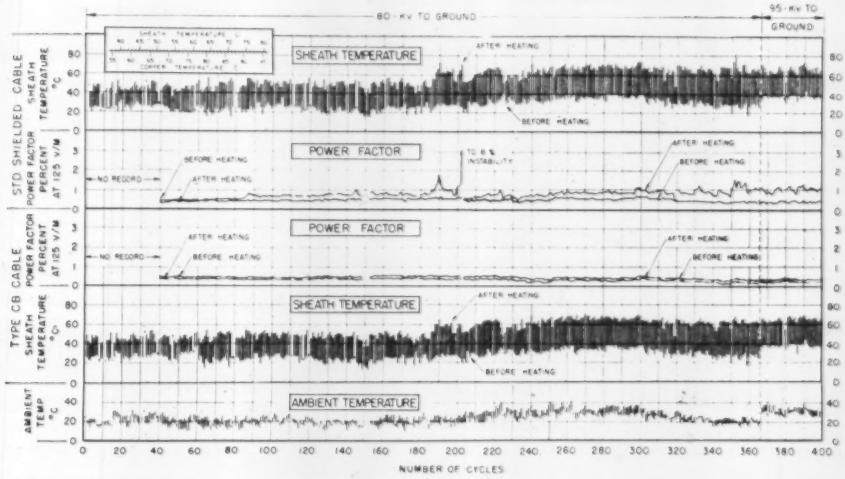
CYCLIC AGING TEST

For dramatic proof, no other test shows stability better than the cyclic aging tests.

The test shown here consisted of subjecting two single-conductor, 69kv shielded-type cables to cyclic aging for 404 daily load cycles. One cable was Type CB, the other a cable of standard construction. Both cables were still in operating condition at the end of the test. The standard cable, however, showed definite signs of aging. The Type CB cable showed no such signs.

WANT TO KNOW MORE? The Man from Anaconda will be glad to give you full information about Type CB cable. See him or write for Bulletin C-89. Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.

*CB—Carbon Black (U. S. Patents 2,102,129; 2,405,853; Reg. U. S. Pat. Off.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0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400
NUMBER OF CYCLES

CYCLIC AGING CHARACTERISTICS of 1 c, 650 Mcm, 69kv solid-type paper-insulated cable, standard construction compared to Type CB construction. Power factor readings during each cycle show low and constant values for Type CB cable—0.3 to 0.5 percent for both. The standard cable, with the same initial values, increased to over 1 percent at the end of the test. Power factor readings before and after heating during each cycle are also significant. At first, both cables show "after heating" values below those for "before heating." In the standard cable, the trend is reversed (69th cycle) and the "after heating" values are higher to the end. In the Type CB cable, the "after heating" values remain below throughout the test.

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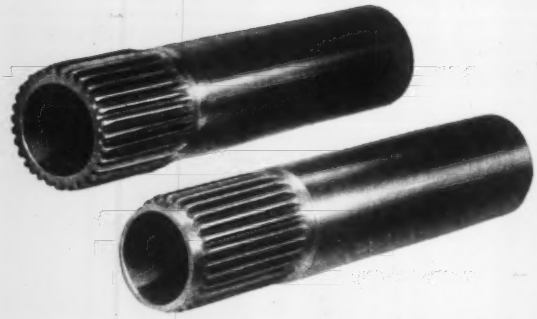
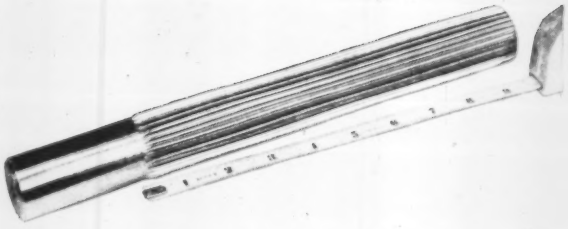


Tubular parts—*On even thin-walled tubes from ½ to 2-inches OD, splines and serrations can now be quickly and inexpensively Roto-Flo cold formed.*



Long splines—*can now be cold rolled on solid as well as tubular parts. 30° or 45° PA tooth forms can be made with this low-pressure method and axially fed parts.*

Announcing a NEW ROTO-FLO METHOD

Now the **ROTO-FLO** chipless process that cold forms toothed parts faster at lower cost is extended to a broader range of parts. The development complements present Roto-Flo equipment.

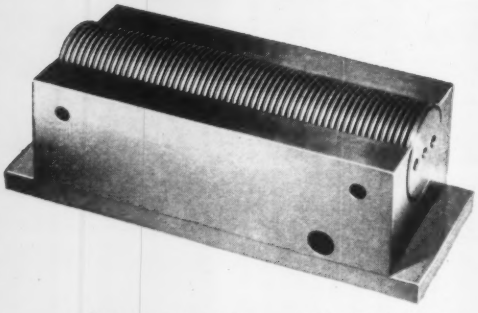
Write for details!

–for spline rolling tubular parts

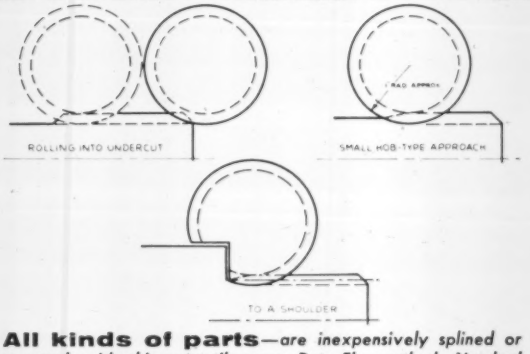
–for splines of any length

–with versatile lower cost tooling

–economical for shorter runs



Lower-cost tooling—*Cylindrical forming racks reciprocate in opposed directions while a part is fed in axially. Racks are indexable to several settings for long life and lower tool inventories. No regrind costs are involved with these throwaway forming inserts.*



All kinds of parts—*are inexpensively splined or serrated with this versatile new Roto-Flo method. Notched racks can form full-depth teeth within ¼ inch of a shoulder. Parts having the same pitch diameter can be rolled with the same rack.*

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These are typical of the many types of quality parts produced from Roebling flat spring steel.

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Three Interlocking Tramrail Cranes Keep Hardware Materials Moving

Floor-operated, push-button-controlled, completely motorized transfer cranes in open warehouse. The cranes run on three tracks supported by the wood trusses. A simple adjustment for leveling Cleveland Tramrail track makes it ideal for any building, especially wooden structures which are subject to sagging and shifting.

Excerpt from letter of Mr. Gilbert Schnitzer, Pres., Woodbury Hardware Company, Portland, Oregon.

". . . and if anyone should inquire of us as to service they have given us in the past 15 years, we shall be very happy to give him an excellent testimonial.

"The cranes have been in constant service since they were installed. The warehouse was first occupied by Woodbury & Co. for storage and distribution of steel plates, bars, structurals, and kindred items, and the cranes had heavy service for several years. The capacity of 3 tons, as you might imagine, was often exceeded, but the flexible suspension, plus the excellent material and construction of the bridge and sturdiness of the hoists, took care of these occasional overloads."

THREE 3-ton, 67'-0" long Tramrail cranes on parallel runways provide fast, efficient handling for a tremendous assortment of hardware materials at the Woodbury Hardware Co., Portland, Oregon. One crane covers a large open warehouse room, and the other two operate over a mezzanine storage. Two or three of the cranes can be interlocked, as required, to permit loads to be run from one to the other. Thus materials can be handled from any point on the mezzanine to any area in the open warehouse room directly without rehandling the loads.

The Tramrail system has meant so much in speeding handling and easing the work at Woodbury Hardware that they declare: "We could not get along without it."

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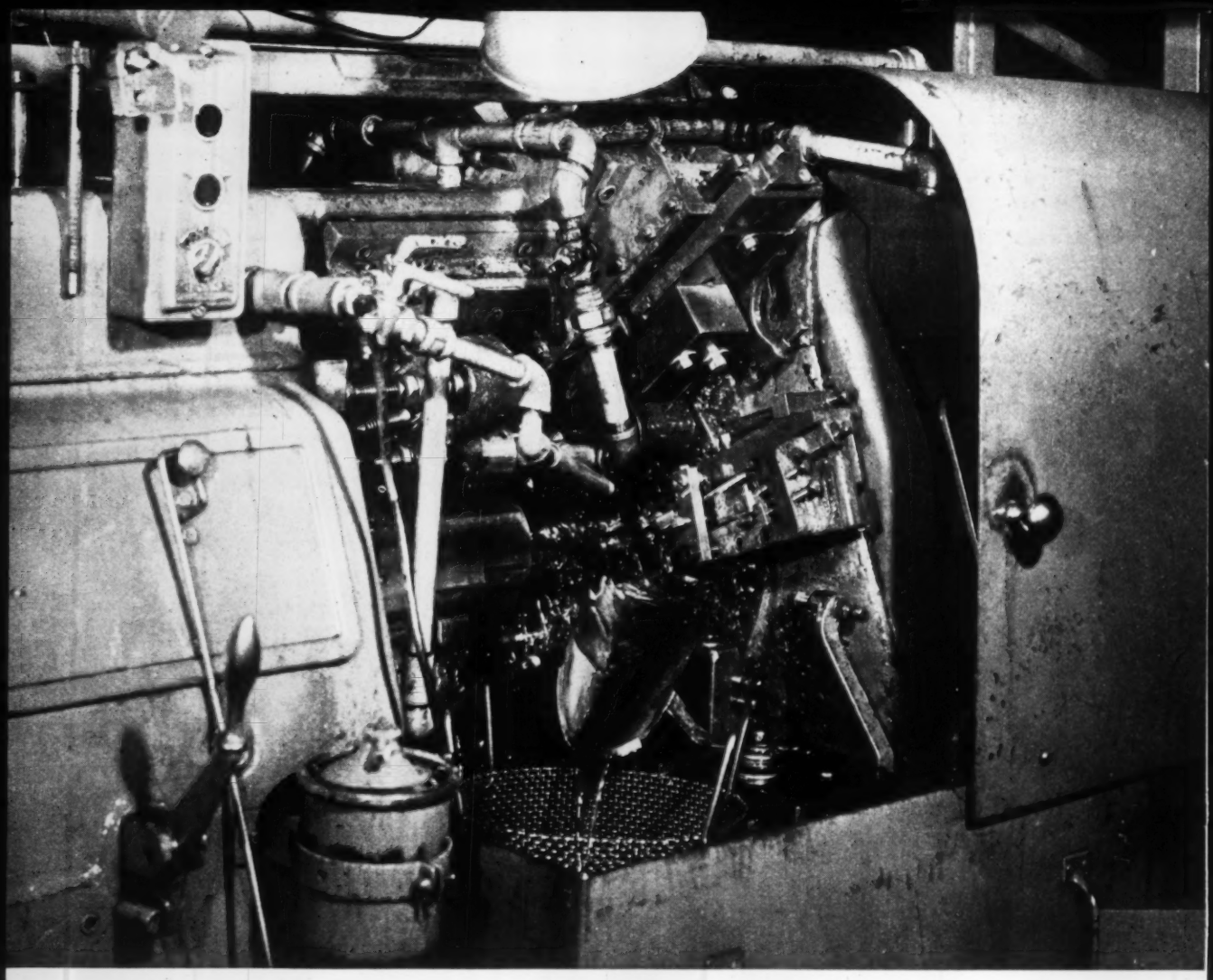


Here's how Transultex reduces automatic screw machining costs

Texaco Transultex Cutting Oil reduces the frictional heat at the chip-tool interface. This prevents chip welding, lengthens tool life and lowers power consumption.

Transultex is transparent, and stays that way in your machines. Inspection is easier. Machined surfaces stay clean, come out with a better finish. Which means fewer rejects, more production.

Texaco Transultex Cutting Oils are part of the complete line of Texaco Cutting, Grinding and Soluble Oils, all designed to help you increase production and lower costs. Simply call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Bethlehem-Youngstown Decision by Fall?

Look for Federal Judge Edward Weinfeld to make a decision on the Bethlehem-Youngstown merger case by fall, certainly no later than yearend. His task is formidable: To sift the voluminous records generated during four weeks of hearings and to weigh the arguments presented in lengthy briefs filed by the government and the steel companies. The government's position: The $2.7 billion merger would violate Section 7 of the Clayton Act. The defendants' major argument: The merger is needed to create a company with sufficient financial and managerial strength to expand, particularly in the Midwest where the merged company would spend $330 million on new plants.

How Steel Costs, Prices Have Risen

Here's what the steel industry has done in the past on price rises (average price boost per ton, vs. hourly employment cost increase): $6—26.2 cents in 1957; $8.50—23.2 cents in 1956; $7.35—21 cents in 1955; $3—7.2 cents in 1954; $4—12.5 cents in 1953; $5.20—20.1 cents in 1952. The 1958 employment cost increase is 24 to 26 cents an hour, including a 5-cent cost-of-living boost last Jan. 1 and a 4-cent escalator hike July 1.

Some Workers Fight Inflation

Not all hourly workers are demanding wage increases these days. Local 669 of the Allied Industrial Workers and Local 1 of Metal Polishers & Platers Union have agreed to a 12.5 per cent wage cut to enable Douglas & Lomason Co., a Detroit plating firm, to remain competitive. The company employs 342, although it once had more than 1000 workers. And employees of McKay Machine Co., Youngstown maker of mill equipment, voted overwhelmingly to pass up a pay increase July 1. They are not unionized but generally follow steel industry patterns.

Nonferrous Prospects: Nickel

Third quarter sales of nickel will match or slightly exceed the performance in the first two periods this year. Expect some spottiness, especially in July, with a gradual improvement throughout the quarter. Spring production slashes brought a better supply-demand balance. Also encouraging are reports that the nickel scrap market is tightening. Look for the nickel price to hold at 74 cents a pound.

Nonferrous Prospects: Magnesium

Third quarter sales of primary magnesium ingot will rise 5 per cent over those of the second quarter, which, in turn, showed a 5 per cent gain over the first. But ingot production will continue to fall this quarter—18 per cent below the second period, which was 40 per cent below the first. Shipments

of mill products are expected to continue the slight upswing they've felt since early spring. The price should remain stable for the next three months at least.

Nonferrous Prospects: Titanium

Shipments of titanium sponge and mill products in the second half should match first half levels (about 2.7 million lb for mill products), say producers. The Business & Defense Services Administration is more optimistic; it pegs second half mill product shipments at 500,000 to 600,000 lb per month. Don't look for many price revisions in the third quarter.

Chilean Copper to Russia?

Chile wants all copper removed from the strategic list so it can sell to Communist countries. The Chilean Copper Department says political and economic conditions have changed considerably, and materials once considered strategic are no longer in that category. Chile says its agreement with the U. S. on the matter has proved harmful to its economy.

New Star Means Investment Opportunities

With Alaska certain to be the 49th state within six months (following Ike's signature and a referendum in the territory), statehood backers assure private industry that a boom is certain. Items: Alaska's legislature passed a law giving ten tax-free years for new processing industries locating there (similar to the Puerto Rican plan); its first nuclear powerplant will be built by 1960 (modeled after the Ft. Belvoir, Va., "portable" installation). One-fifth the size of the U. S. it is rich in minerals, including nickel, chromium, tin, gold, coal, iron, copper, and oil. Needed: More people (it now has only 200,000) and a railroad from the U. S. to Alaska.

Fast Writeoffs Won't Help, Says Kidde

A five-year writeoff provision for corporations would not significantly increase capital spending by industry in 1958 and 1959, claims Walter Kidde Constructors Inc., New York. It has just queried 500 of the largest U. S. manufacturers. Respondents account for about 16 per cent of estimated U. S. capital expenditures in '58. The survey also indicates that industry plans to spend less in '59 than in '58 (about $30.8 billion will go for capital plant and equipment this year).

Straws in the Wind

An estimated $100 million in Great Lakes port improvement and $142 million in work on connecting links between the lakes is still to be done before the St. Lawrence Seaway's full potential can be realized . . . Studebaker-Packard Corp. and the United Auto Workers have begun talks on a new contract to take effect Sept. 1 . . . Initial alumina production has started at the Ormet Corp. plant at Burnside, La. . . . American Smelting & Refining Co. shut down another block of zinc retorts at Amarillo, Tex., July 1 . . . Associated Spring Corp., Bristol, Conn., has a "Springback Formula" to overcome the recession . . . Phelps Dodge Corp. raised copper prices to 26.5 cents a pound to match Anaconda Co.'s; Kennecott Copper Corp. was expected to follow; custom smelters will also probably make increases.

Is heat treating costing you more than it should?

A FRANK APPRAISAL OF YOUR METHODS MAY WELL BE IN ORDER!

Every so often, it pays to re-evaluate every production phase in the light of new developments. This is especially true of heat treating. A method change here or a piece of more modern equipment there can spell vitally important cost savings . . . a fact that Ajax has proved in hundreds of cases.

The outstanding basic advantages of salt bath heat treating for most applications are now, of course, well known. These include: faster, more uniform heating by conduction; elimination of atmosphere problems; negligible distortion; ease of selective heating; faster production in less space with unskilled labor; and various others.

Not so well known, however, are important recent developments in salt bath furnace types. The new Ajax design in which a pair of submerged electrodes can be changed in a short time without tearing down the pot is an example. Ajax Cataract Quench Furnaces which give molten salt quenching power equal to that of oil are another. Ajax gas-fired salt baths are still another.

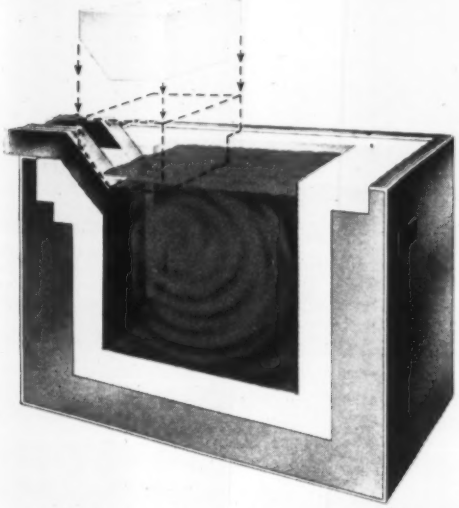
Equally important, there have been 10 league strides in applying salt bath processing to still better advantage and in mechanizing it for substantial labor cost reductions.

As salt bath pioneers and with connections in many parts of the world, it is only natural that Ajax should have led in most of these while being thoroughly familiar with all.

The chief product of Ajax is heat treating "know how" . . . not merely the largest assortment of salt bath furnace types on the market.

Thus Ajax heat treating specialists welcome the opportunity to make recommendations from the background of their unsurpassed experience. While freely admitting that salt baths do not answer every need, they work on the demonstrable knowledge that Ajax Salt Bath Furnaces are scoring important cost reductions on an ever-increasing list of applications while materially boosting quality and efficiency on many.

No obligation is entailed in having Ajax make a frank appraisal of your heat treating situation.



The most efficient heat treating principle for a wide variety of work . . . Pioneered by Ajax in the largest line of furnace types, shapes and sizes for modern production requirements.

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UNBREAKABLE MAINSPRINGS OF ARMCO 17-7 PH STAINLESS Help Make Westclox Watch Sales "Tick"

Properties of special Armco Stainless Steel add sales points, improve performance and simplify production of watches

By using Armco's high strength stainless steel instead of regular spring steel, Westclox, producers of the famous Big Ben, eliminated the possibility of rusting and subsequent breakage of mainsprings.

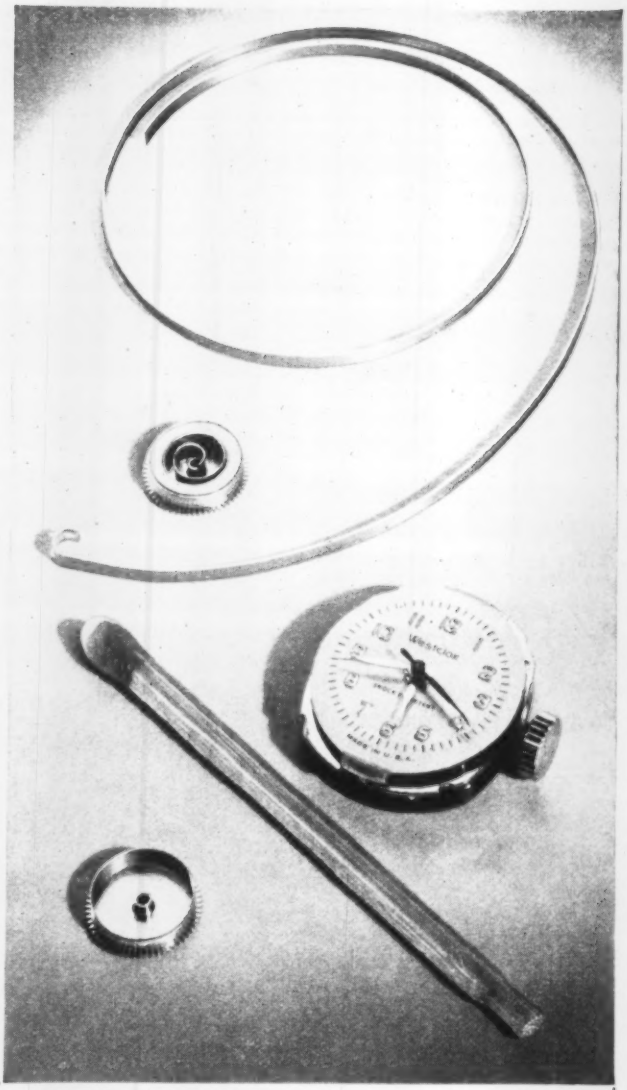
In addition to this important sales advantage, the excellent spring properties of 17-7 PH insure better time-keeping. Westclox also reports that springs are easier to fabricate. A thinner mainspring is used too, resulting in space-saving and more parts per pound.

SOLVES SPRING PROBLEMS

For springs of *any* kind, especially those exposed to corrosive conditions or elevated temperatures, Armco 17-7 PH provides unusual advantages. The mechanical properties and modulus of elasticity of hard drawn wire and extra hard temper strip are comparable to music wire and are much less affected by temperatures to 650 F than either 18-8 stainless or music wire. And with resistance to corrosion that is practically equal to Type 302 stainless, it offers a valuable combination of durability and strength.

Available in sheet, strip, plate, bar and wire, Armco 17-7 PH Stainless Steel is readily fabricated into coil, flat and power springs as well as spring washers and clips.

Consider how its unusual properties can give *your* products new design and sales advantages. For complete information, just fill out and mail the coupon.



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Russia's Weakness

After 40 years of Communism, the Russian people still have few of the ordinary things that are taken for granted in Western countries.

There are no corner drugstores, or gas stations, or hot dog stands, or outdoor movies. Automobiles and refrigerators are for the chosen few.

There are no expanding suburban areas for pleasant family living in homes.

There is no free press, no advertising.

There is no variety in food, no styling in clothing.

There is no freedom to move about . . . or even talk.

But worst of all in the dull, dead monotony of Communist Russia, there is no true freedom of religion. Most churches are museums to symbolize what to Communism is an evil part of Russia's bourgeois past.

Says Dictator Nikita Khrushchev: "I think there is no God. I have long ago freed myself from such an idea. I am an advocate of the scientific world view. Science and the belief in supernatural forces are incompatible."

The Russian dictator wants to force that way of life on the rest of the world.

"The time has come," he said earlier this year, "when capitalism must give way to a new, more progressive system which is what the socialist system is. Their own working classes and working masses will see to this; it is only necessary to have patience."

Will the Communist system eventually prevail? We don't think so. It has succeeded in building a formidable industrial base at the expense of a decent standard of living for its people, by slaughtering those who oppose it, and by setting up Lenin to be revered in the place of God.

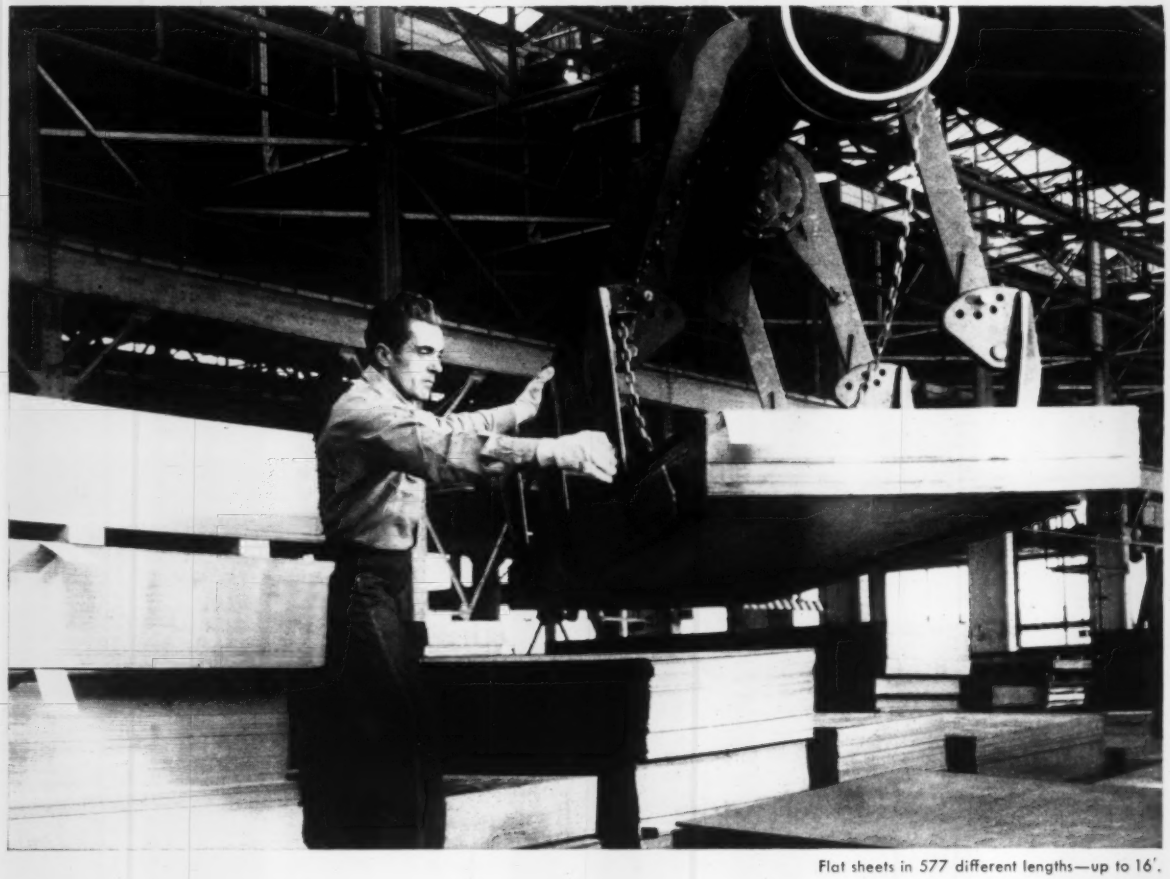
Man is nothing but a selfless pawn in the Russian scheme, and we believe this denial of human values is the chink in the Soviet's armor.

Communist leaders are already making some concessions. For example, they have found that they must appeal to a man's self-interest through incentives to get him to do his best work. They are finding that the red tape of its industrial organization and management must be untangled.

The Russians may realize that man must have something to cling to besides science and machines, but don't expect them to go too far in this direction. And that's to the advantage of the Free World. The Soviet system is severely handicapped as long as it is spiritually weak.

Irwin H. Such

EDITOR-IN-CHIEF



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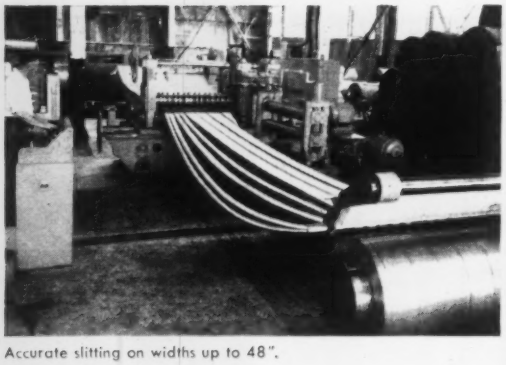

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This means you can minimize, or even eliminate, the problems of variation in forming and welding quality—caused by the average wider range of carbon content.

You'll also find Ryerson prepared to give you fast, accurate service on your special requirements: strip and sketch cutting, blank shearing, edging, coil slitting, etc.

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Rough Transition Into Space Age

Dropping: Aircraft Industry Profit, Unit and Dollar Volume

The industry's future looks bumpy until missile spending increases enough to offset declining aircraft production. One scientist wants combined action on space projects

BACKLOGS of aircraft companies in the first three months were $200 million under 1957's last quarter figures. As of Mar. 31, backlogs were 20 per cent lower than they were a year ago, indicate surveys by the Census Bureau and the Civil Aeronautics Administration. (The figures apply to over 50 firms making aircraft, engines, propellers, and parts.)

Source of Trouble—An Aircraft Industries Association spokesman blames it on "the decline in purchases of military aircraft and a possible drop in utility aircraft orders caused by the recession." Backlogs total $14.3 billion. He expects the drop in production of military planes this year to match last year's rate of decline (6800 were built in 1956; 5500 in 1957, estimates AIA).

Shipments of civil aircraft through April are equaling last year's, but that isn't firm assurance for the last half.

Missile Role—Included in backlogs are $2.3 billion worth of orders for "other products and services," mostly missile and space projects. The increase from a year ago in this category is slight (less than $100 million), but net new orders showed a $150 million gain over net sales during the first quarter.

All the missile and space business is not going to the aircraft industry, but it gets 50 to 75 per cent of the dollar value. That promises to hold true—and support the industry close to the manner to which it is accustomed.

About $3.4 billion will be spent on missile programs in fiscal 1959, compared with $3.0 billion in fiscal 1958, $2.1 billion in fiscal 1957, $1.2 billion in 1956, and $0.7 billion in '55.

You can't assume the aircraft industry misses out on missiles because of the amount of electronic equipment in the birds and the tremendous number of electronic firms working on them. All airframemakers are in electronics, and the trend is to get in deeper. One industry spokesman suggests chances are good for mergers among large airframe builders and the relatively untried, small electronic outfits which are springing up.

Civil Aircraft Role—Don't expect the industry to turn to civil sales to offset declining purchases of military aircraft. The demand isn't there. Two airframe builders probably could account for all U. S. civil production if they decided to go after it. Foreign competition also is increasing. Over 13 per cent of the world's airline ships (excluding Russian) are British built.

Industry Definition — Despite awards of some prime contracts for missiles to nonaircraft firms (Sidewinder, Jupiter, Hawk, and the Nike are examples), organizations like the Aircraft Industries Association are stepping up efforts to grab more business. "Getting missiles and men

into space, guiding them in their missions, and bringing them back is an extension of aviation," claims Gen. Orval Cook, AIA president.

The industry agrees with the Air Force and its official doctrine that "air and space are indivisible." Both are attempting to extend their traditional roles as rapidly as science and technology will allow. "Some aircraft companies are heavier in guidance than many so-called electronic firms. As they move farther afield, the term 'aircraft' becomes meaningless: North American Aviation Inc. is one of the country's most important atomic firms," is the way AIA sums it up.

One aspect of the shift to missiles: Some firms are hiring at their missile plants, while laying off at their aircraft plants. High bay facilities and production line techniques of aircraft manufacture are often not adaptable to missile-work. Surplus manufacturing space is bound to increase, and some eastward shift of the industry is also possible as the Pentagon encourages dispersal from California.

Spending Ceiling—The industry's biggest headache is probably in planning. With Pentagon policies sometimes shifting almost overnight, the industry is forced to fly by the seat of its pants. Cmdr. Edward Sack, head of the purchasing branch of the Navy Bureau of Aeronautics, told a Washington missile conference that the bureau originally planned to procure 36 models of aircraft in fiscal 1958. As of Jan. 1, 18 were canceled, and purchases of the remainder were cut 29 to 82 per cent. Unanticipated costs made it necessary even though the Navy was aware of the hardships created for industry. Missiles aren't immune to cutbacks either: Procurement of some models was cut 9 to 46 per cent, said Commander Sack.

The commander put some of the blame on the industry itself: "Few firms feel a great need to slash their costs."

As defense spending climbs from $40.3 billion in fiscal 1958, a greater proportion will go to missile and space programs. Look for the aircraft industry to reverse its downward trend in sales dollars (see table) by 1960. Missile dollars will more than counterbalance declining aircraft unit volume, and the cost of military aircraft will increase.

The Aircraft Industry's Troubles at a Glance

	1954	1955	1956	1957	1958
DOLLAR VOLUME (Billions)	8.3	8.5	9.5	11.8	11.0*
PROFITS (per cent of sales)	3.7	3.4	2.8	2.4	2.2*
AIRCRAFT UNIT VOLUME	12,129	12,852	14,005	12,156	10,500*

Source: Aircraft Industries Association. Dollar volume is total sales of makers of complete aircraft, engines, propellers, parts. Profits are for 12 leading airframe builders.
*Estimated.

Basic Problems—Rising sales will not be followed by rising profits as long as the industry is hampered by renegotiation, claims AIA. Profit figures for the last four years are still subject to it. The AIA wants to change the Renegotiation Act to let firms keep extra profits stemming from cost cutting practices.

Although much of the industry's capital investment is government sponsored, leaders report they fail to make much money on research and development. A. S. Mrozek, sales director, Ingersoll-Kalamazoo Div., Borg-Warner Corp., believes the return on investment is bound to be much better in defensework than commercial. But Joachim Kauffmann, president, Diversey Engineering Co., another industry subcontractor, notes profits run from "amazing to disconcerting."

Team Concept—Two trends are fighting each other. Dr. Herbert York, chief scientist, Advanced Research Projects Agency, thinks the weapon system concept of aircraft and missile development may be de-emphasized, allowing more contracts to go directly from Uncle Sam to the manufacturer.

But Dr. Walter Dornberger, technical assistant to the president, Bell Aircraft Corp. (and chief of Germany's V-2 program in World War II), believes the industry's future lies in teamwork by firms not merged in a corporate sense. Teams of companies and industries will be welded together, although individuals may change teams as their talents are needed.

An example of that concept is the award of an AF contract for an all-weather reconnaissance system to Temco Aircraft Corp. which heads an association of six other firms: Goodyear Tire & Rubber Co., Radiation Inc., Northam Electronics Inc., Electronic Communications Inc., American Institute for Research, and Aerophysics Development Corp., a division of Curtiss-Wright Corp.

Dr. Dornberger believes the team concept will help avoid situations like this: Ninety-six firms bid on a small project at Huntsville, Ala. Each put 20 engineers on feasibility studies. Millions of manhours and dollars were wasted, he believes, before the project was finally awarded.

Organization of industry is needed for space, sums up Dr. Dornberger, because of: 1. High cost of R&D. 2. Capital outlay for testing and launching facilities. 3. Shortage of topnotch scientists and engineers. 4. Diversity of industries needed for one project.

Invitation — The industry welcomes participation from more firms. More R&D by smaller firms not necessarily identified with aircraft is needed. Solid propellents for both airplanes and missiles represent a wide-open field, and contributions must be made in highly specialized component work.

Plating Sales Are Slow

Chances for improvement in second half hinge on automotive demand—it's weak now. Producers improve quality, study new processes to boost applications

ELECTROPLATERS lack volume to keep facilities operating at economical levels. Operations of job platers are 25 to 80 per cent below what they were a year ago, a STEEL study shows.

Business is slowest in Detroit—operations are as much as 75 to 80 per cent under year-ago levels. The dropoff in auto production is the immediate cause, although business has been slack since the end of the Korean War.

Industry observers say Detroit platers were left with too much capacity after automakers moved final assembly lines out of the area. Auto companies also do some of their own plating, and several captive shops are said to be winning orders which formerly went to smaller platers.

Some industry leaders admit that job shops have contributed to their own misfortunes. They contend that if job shops had made their plants more efficient and had diversified, fewer would be troubled with low sales. Several observers believe the recession will have a healthful effect on the industry by weeding out weak companies.

Strength in Midwest — Although producers of consumer and capital goods have cut their electroplating requirements, midwestern job platers say the electronic industry is a strong customer. They also report spurts in production of metal novelties, houseware, hospital equipment, and builders' hardware. Those industries contribute to a mildly encouraging outlook for the remainder of this year.

Job platers anticipate a slight upturn will start in August and gain some momentum through the fourth quarter. Appliance makers are expected to increase their demand in the fall, but hopes for a major pickup depend on the acceptance of 1959 autos.

Hard Selling in All Areas—Job platers are competing sharply. Faring best are shops with automated facilities. They enjoy cost and service advantages. Some fully automated shops in Cleveland and Detroit are seeking orders as far afield as Pittsburgh.

Closely associated with sharp competition is widespread price cutting —not new in this industry. Discounts and freight concessions are common. Some operators consider this a normal condition, although they say some quotations are "ridiculous" and that cuts have driven prices below World War II levels.

With volume down and competition up, many job platers do stamping or diecasting. They offer prime contractors a finished product.

Competition among metals is also developing. Growing use of aluminum is causing much concern. The impact of the light metal is greatest in the automobile industry, where it's used in increasing amounts for trim and decorative parts.

Brighter Side—The industry has been given a lift by the end of the nickel shortage which delayed technical developments. Trade and technical associations such as the American Electroplaters Society and the National Association of Metal Finishers are working to improve specifications with an eye to maximum corrosion resistance and superior finish.

It's reported that a large automaker will double the thickness of nickel on brightwork for 1959 models. There's also increased interest in plating with other metals, including gold, silver, and rhodium.

What's Ahead — Here are some new processes that bear watching:

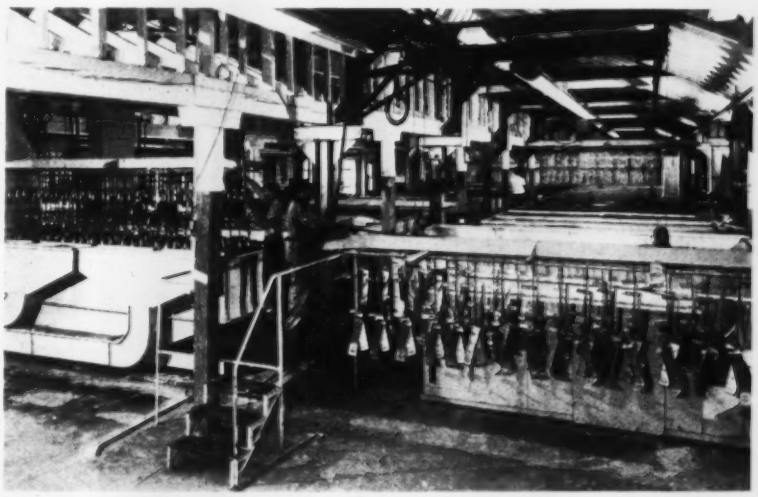
1. Nickel coating which incorporates inert colloidal dispersions to provide increased hardness and wear resistance.

2. A new nickel-phosphorus coating applied to steels by hydrogen reduction at high temperatures. The product is said to have good brazing and corrosion resistance qualities.

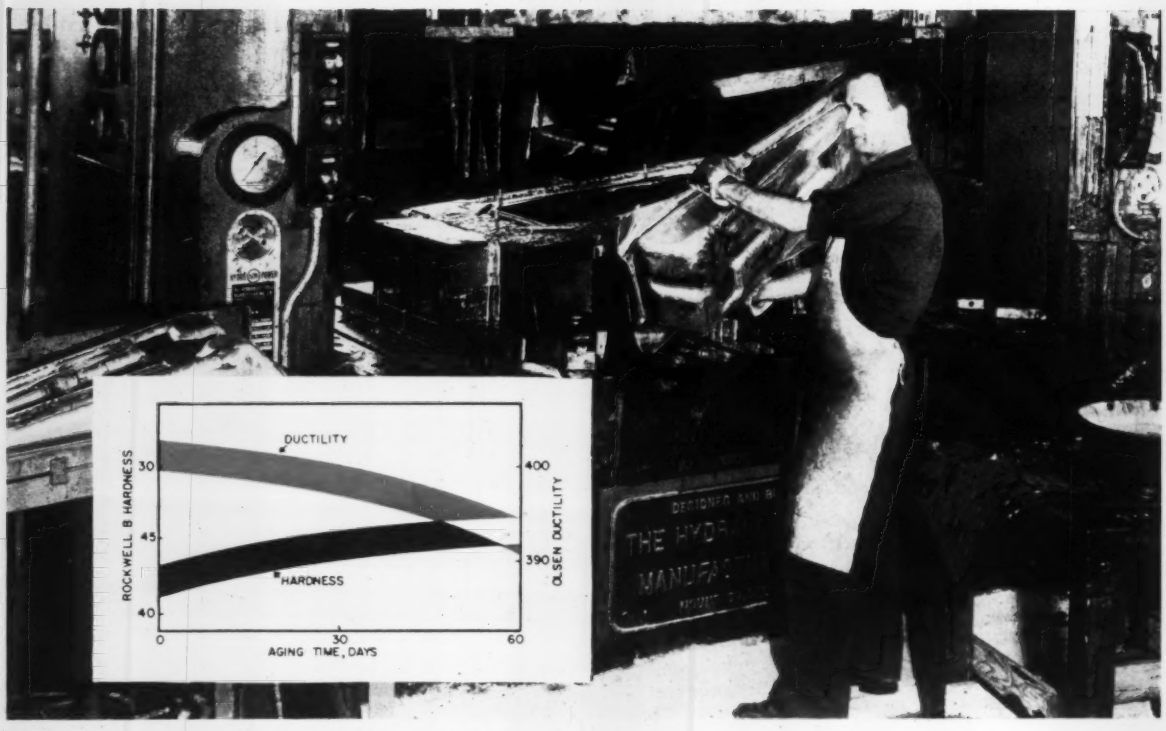
3. A bright, crack-free chromium process reputed to have superior corrosion resistance.

4. A nickel-tin alloy deposit which resists certain acid and alkaline environments. It is a nickel-on-steel application for tin plating.

5. Developments in bright nickel plating (nickel under the chromium). It is said to provide considerable cost savings in polishing.



This U-shaped hoist line at Adolph Plating Inc., Chicago, can process items as long as 14 ft. At left, work carrier loaded with golf cart wheels for bright zinc plating starts its journey. Emerging at right is a carrier load of electronic parts finished in zinc chromate



What two months of aging does to temper rolled rimmed steel

Remedies for Steel 'Aging' Closer

Better understanding of mechanism leads producers to believe they can eventually make low-cost nonaging steel. Some help is available now

AGING, the bane of drawing steel, is being licked.

"All the effects of aging can be eliminated by combined chemical and mechanical control without the necessity for complete control by either," E. R. Morgan, Jones & Laughlin Steel Corp., told a recent SAE meeting in Detroit. "Prospects that new nonaging steels can be produced are good."

That's good news for automakers and all others who draw low carbon steel.

Triple Trouble—When low carbon steel ages during the time lag between mill processing and customer use, three things happen, all bad.

First, the steel increases in yield strength, leading to buckling and bad shape in drawn parts. Later, the yield point returns, and the steel deforms unevenly in bands called stretcher strains (Luder's bands), which give a poor surface appearance. Finally, if the steel ages long enough, it loses ductility. That causes it to break in the die.

Several Ways Out—Some of the things that steelmakers and users are working on to evade those effects of aging are:

1. Classification of drawing jobs: Deep drawn parts may require a chemically controlled steel for maximum ductility, but for shallow drawn parts where only surface finish is important, mechanical control may be enough.

2. Improvement in surface quality of aluminum killed steels: Various types of bar aluminum, suspended in the mold during or just after pouring, have shown ability to do this.

3. Better oxygen sampling tech-

niques: A better method would help in controlling the oxygen content of the steel more closely. Then boron could be used more easily as an addition agent.

4. Increased use of boron and vanadium additions: They can prevent loss of ductility even though they may not be successful in preventing return of the yield point.

5. Modifications of rolling procedures: More knowledge of factors in temper rolling such as grain shape and amount of tension will help in mechanical control.

Traditional User Controls—Companies that draw steel can buy it "as annealed" and do their own cold rolling immediately before sending it to the presses; they can attempt to schedule deliveries so that steel doesn't have time to age in storage; or they can pay the premium for killed steel instead of relying on rimming steel.

But none of the three approaches has enough economic attraction to be widely adopted. That drops the aging problem back into the steelmakers' laps.

Traditional Maker Methods — Mills have attacked aging from both chemical and mechanical angles. Chemical methods include using aluminum to "kill" ingots; and adding vanadium and boron to produce nonaging rimmed and capped steels. Both techniques control the amount and distribution of free oxygen and nitrogen in the steel.

Mechanical methods include using temper rolling and roller leveling (light cold working) to mask the yield point, but it returns in time. Roller leveling can mask it again, but cannot restore ductility if aging has gone that far.

For further help, steelmakers are turning to theories of deformation and aging.

Aging Theory—Metals are believed to deform plastically by the movement of crystal defects called "dislocations." In low carbon steel, they are locked in place by carbon and nitrogen atoms. It takes a certain amount of stress (the upper yield point) to break the dislocations free, after which they will move from grain to grain in avalanche fashion at much lower stress.

Cold work, such as temper rolling, frees dislocations so that the steel can be deformed (as in drawing) at low stress levels. But if the steel has time to age, carbon and nitrogen atoms migrate back to dislocations and lock them up again, and the yield point returns.

With more aging, some of the free atoms congregate to form precipitates. They lead to local work hardening and reduce the ductility of the steel. Aging may raise the yield strength of rimmed steel as much as 9000 psi.

Practical Control—This picture of strain aging suggests three ways for getting around it:

1. Control the rate at which atoms migrate.
2. Control the time available for migration.
3. Control the amount of carbon and nitrogen atoms which are free to migrate.

The rate can be controlled by refrigerating the steel, but that isn't practical for large quantities.

The steelmaker can partially control aging time by temper rolling the steel just before he ships it, but he has no control after the steel leaves his plant. He is left with the alternative of controlling the amount of nitrogen and carbon in solution.

Removing C and N—Careful annealing is an answer to carbon control. It is not a significant contributor to strain aging in a properly box-annealed steel.

Nitrogen can be removed from solution by alloying it with a strong nitride-forming element. When aluminum, titanium, zirconium, or columbium are used for this purpose, they produce a relatively expensive steel because of poor yield. Vanadium and boron do not make a killed steel, but vanadium requires extremely careful processing to guarantee nonaging results, and boron has a strong affinity for dissolved oxygen which leads to other steelmaking problems.

Each technique is a step in the right direction. As steelmakers develop their double-barreled attack by chemical and mechanical control, users of drawing quality steel can expect better results at the presses.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Ore Picture Dim

Our security depends on mineral strength. Bureau of Mines official calls for policy review

BY 1970, we will import more than 40 per cent of our ores.

That's the opinion of E. W. Pehrson, chief, Foreign Activities Division, U. S. Bureau of Mines. He stressed the importance of ores to our world political strength in an address before the American Society for Testing Materials, Boston.

He slapped at our smugness with these facts:

- India and Brazil have most of the world's high grade iron ore.
- Russia is the only world power producing all its own ferroalloys.
- Unlike Western powers, the Sino-Soviet bloc is self-sufficient in coal and minerals.
- Russia is ahead of us in the development of low grade ores.

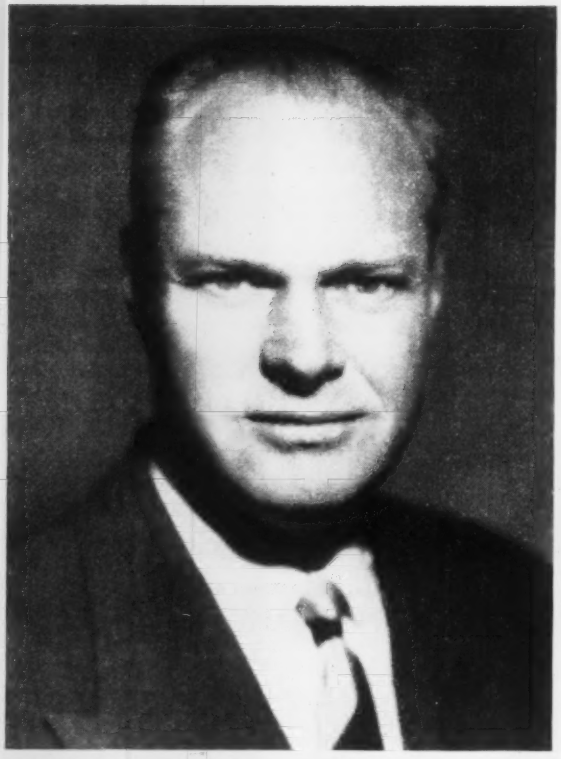
Supplies Exhausted? — To point up our position in mineral resources, Mr. Pehrson said that our country has been heavily prospected while Russia and China remain comparatively untouched.

He contended that minerals, not politics, are the foundation of industrial and military power. In emphasizing the great importance of good coking coal, he warned: The U. S. leads, but watch China. She has the world's third best supply of coking coal, good mineral reserves, and a readymade market of 600 million.

Evidence of Old Age—Mr. Pehrson believes that our mineral reserves place us in peril. Stockpiling and similar policies, he said, are created with the short term view. "We used to produce our own iron, petroleum, copper, bauxite, lead, and zinc." Today, we import substantial amounts.

To combat dwindling reserves, Russia and the U. S. have developed low grade deposits like taconites. Both countries have adequate supplies, but Russia far outstrips us in their development.

Can They Be Far Behind?—The Soviet gross national product is growing twice as fast as ours. In 1950, her GNP was 33 per cent of ours. By 1962, that ratio is expected to reach 50 per cent.



RUDDICK C. LAWRENCE
Vice President—New York Stock Exchange

We hope other companies will follow your lead . . .

GEORGE ROMNEY
President, American Motors Corp.

This plan furthers the economic education of employees . . .

Looking for an Employee Stock Plan?

AMERICAN MOTORS CORP. has extended its unique stock purchase plan to salaried workers at its automotive and plastic plants in Kenosha and Milwaukee, Wis. (Hourly workers also will be given the opportunity to participate.)

The New York Stock Exchange, which helped AMC set up the system through Wm. C. Roney & Co., the Detroit brokerage firm, believes other companies will adopt the program, which is an industry first. Ruddick C. Lawrence, vice president of the stock exchange, told AMC: "We are watching the growth of your program with great interest and hope that other companies will follow your lead in making it easier to invest in America."

It's Different—The company does not contribute. It simply acts as a collection agency. The employee can buy any stock he chooses (including AMC's), and the company cannot influence his selections.

John Farley, Roney representative handling the AMC account, adds: "This method helps do away with the little investor's bugaboo of wanting to buy 100 shares of $10 stock which may be questionable. Instead, he can buy one share (at a time) of a $100 stock which will be a solid investment for the future."

How It Works—The setup is a combination of the New York Stock Exchange's Monthly Investment Plan (MIP) and payroll deductions through AMC, assuring workers of having funds to invest.

George Romney, AMC president, explains the mechanics this way: "Employees enroll in the plan by completing two forms. One is a payroll deduction authorization through which the worker specifies the monthly or quarterly sum to be deducted (a minimum of $42 quarterly is required). This amount is forwarded to the Detroit office of the brokerage firm where each employee has his own MIP account.

"Secondly, the employee signs an MIP purchase order form in which he designates the stock of his choice, inserts the form in an envelope, and seals it. The company transmits it directly to the broker's office."

Employees may use the counseling services of Roney & Co. or anyone else. Each account is separate, and any of the 1200 stocks listed on the New York exchange are available. It's possible, for example, to buy a share of General Motors

stock one month and a share of General Electric the next month.

Slow To Grow—AMC reports over 12 per cent of its salaried employees at Detroit have already signed up. More are expected to join as they become better acquainted with the plan's potential benefits. Mr. Farley points out that a majority of participants are buying AMC stock, but he adds: "Most persons who enter any investment plan take a while to become educated. They begin to select different stocks as they gain experience and interest."

While AMC is the only firm with this system, several offer investment counseling for interested employees.

Another Plan—The Oil, Chemical & Atomic Workers International Union is asking its industries to pay a royalty on each unit of oil, gas, or chemical produced. The funds would be used to create an industry-wide stock investment pool.

The money would be invested in a lump sum, but each worker would own part of it and could withdraw his share at his option. The OCAW hopes to win such a clause from several firms this year and make it a national demand during the next negotiations.

Outlook—AMC is not yet in a position to comment on advantages of stock ownership by hourly workers who are union members. But in speaking about participation of salaried workers, Mr. Romney says: "First-hand experience with the rewards and sacrifices involved in our profit and loss system is a useful form of adult education. The spreading of stock ownership as broadly as possible through our industrial society should heighten the public's appreciation of the function of profits and perhaps in time help strengthen the bond between management and employees."

Barde Steel Reorganized

Barde Steel Co., Seattle, is now independently owned and managed. The warehousing organization conducts operations in Washington, Idaho, western Montana, and Alaska. Officers are: President, Harold Barde; vice president, T. E. Barde; vice president-sales, R. W. Raport; vice president-purchases, H. G. Ainslie; secretary-treasurer, F. Fredrikson.

Army Shows Missile Power

Fourteen missile contractors cosponsor an Army display of birds at Ft. Bliss, Tex., and White Sands, N. Mex. Spectators: 400 top industry, government, and military men

THE ARMY paraded its missile might before 400 top industry, military, and government officials at Ft. Bliss, Tex., and White Sands, N. Mex., last week.

To the military and government men, Project AMMO (Army Mobile Missile Operation) gave proof that this country is moving effectively into the space age. The Army showed all its surface-to-surface and surface-to-air weapons.

To industry men, the show culminated the first stage of their efforts to develop more exotic metallurgical, chemical, and electronic materials for the space age. It also served as a warning that still better materials will have to be developed.

Better Metals Needed—Fourteen major Army missile contractors represented at the shoot are unanimously agreed that tomorrow's weapons will call for materials with properties far beyond those now available. U. S. Steel Corp. officials noted that new alloy steels in the 280,000 to 300,000 psi tensile range are playing an important role in missiles.

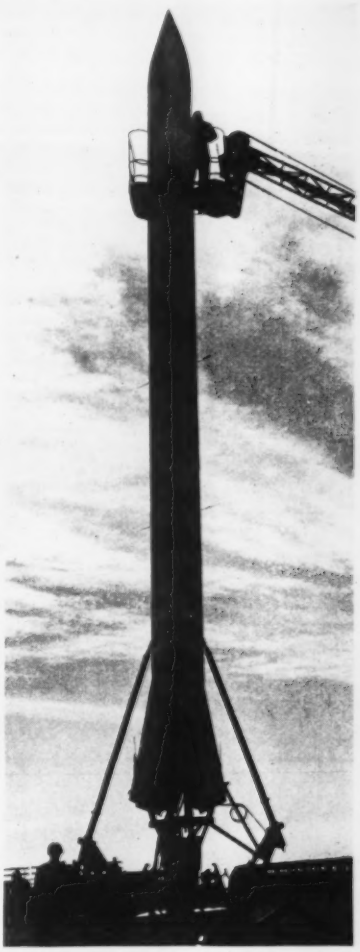
Vying with the missiles for visitor admiration was supporting equipment—handling, erecting, transporting, and launching facilities—which represents a far heavier tonnage of metals than the weapons themselves.

Tip-off—A new wrinkle at the shoot was a demonstration of armed helicopters (carrying aerial machine guns and rockets) designed to give better maneuverability to both attacking and defending forces. They suggest a new boom in whirlybirds.

Army Secretary Wilber M. Brucker promised the visitors that the Army is preparing for "one or two lunar probes." He declined to say when the attempt will be made, but stated that the Jupiter would provide the kickoff.

Missiles and Makers — Missiles fired during the shoot: The supersonic, surface-to-air Nike Ajax; the surface-to-surface Corporal; the free-flight Honest John; the surface-to-air Talos; the low-flying Hawk; the smaller Dart; Lacrosse; and Little John.

Contractors cosponsoring the shoot included: Chrysler Corp., Curtiss-Wright Corp., Douglas Aircraft Co. Inc., Firestone Tire & Rubber Co., Gilfillan Bros. Inc., Martin Co., Northrop Aircraft Inc., Radio Corp. of America, Raytheon Mfg. Co., Sikorsky Aircraft Div. of United Aircraft Corp., Sperry Rand Corp., Thiokol Chemical Corp., U. S. Steel Corp., and Western Electric Co.



The Corporal, one of the missiles viewed by the industry leaders, sits on its launching pad while being serviced

Executive Branch May Bypass Congress

ONE of the most controversial parts of the Minerals Bill O.K.'d by the Senate Interior & Insular Affairs Committee (S. 4036) (see Page 118) is the provision giving the Department of the Interior borrowing authority of up to $350 million.

Without it, Congress would have to pass two pieces of legislation this year (one authorizing the Minerals Stabilization Program, the other appropriating money for it) and another appropriation bill each year for the five-year life of the program. Because Interior has borrowing authority from the U. S. Treasury, it bypasses the annual ritual of appropriations.

To understand what that means, check the Mutual Security Program's progress. It passed both houses in the authorizing form with less than $300 million cut from the President's original request. A subcommitee working on the appropriation bill for foreign aid cut it by almost $500 million. Legislators passed the authorizing legislation with the smaller reduction, knowing they could prune more when the appropriation measure came up.

You can look at the minerals program this way: It would almost certainly pass both houses if it lacked the borrowing authority provision and called for additional appropriation legislation. It would be a good move by all legislators to convince the folks back home they were worried about distressed mining conditions. When it came to appropriations this year or in any year of the next five, they could always change their minds for one reason or another. Such has been the history of the tungsten program. Now, mineral-minded senators are attempting to set up a complete five-year program. They want to have the executive branch bypass Congress.

Similarly, the Pentagon hoped to grant Secretary of Defense Neil McElroy increased spending responsibility by allowing him to transfer funds from one service to another without Congressional O.K. This was part of its original Defense Department Reorganization Bill.

An Explosive Reaction Is Brewing

The situation has bothered conservative congressmen since the first Reconstruction Finance Corp. legislation in 1932. The RFC was authorized to sell its obligations to the Treasury without Congressional approval and the precedent carried through housing legislation, small business loans, various foreign loan programs, and others. As of June 30, 1957, reports Sen. A. Willis Robertson (D., Va.), $143 billion has been borrowed from the Treasury with over $28 billion outstanding. Commenting on the $9 billion authorized this year by the Senate Banking & Currency Committee, Senator Robertson charges: "The effectiveness of our entire budget and appropriation procedure is placed in jeopardy." He used that argument on the floor in connection with granting the Small Business Administration's investment division the right to loan $250 million to loan and development companies, but he was voted down.

With the Treasury about to receive another hike in the debt ceiling, you can expect the senator's point to signal the beginning of a long but probably futile fight to keep spending in the hands of Congress.

Where the Budget Bureau Stands

The executive branch also bypasses Congress by not spending money Congress has told it to spend. Rep. Daniel Flood (D., Pa.), has moved that the Budget Bureau be abolished, and other Democratic leaders have introduced bills prohibiting it from impounding Congressional appropriations. In the words of Sen. Albert Gore (D., Tenn.), the bureau's power is a "trend away from representative government."

Demands by administration officials (in or out of the bureau) to hold spending within certain limits are regarded as outside the constitutional powers of the executive branch—the atomic airplane program is one recent issue revealing this sort of maneuvering.

The basic argument is this: Is an appropriation by Congress authority to spend or a directive to spend? Around this question and Senator Robertson's point of order whirls a great deal of basic controversy about the operation of our government. With Uncle Sam's dollars so important to economic health, business leaders should probably pay more attention to some of these constitutional issues.

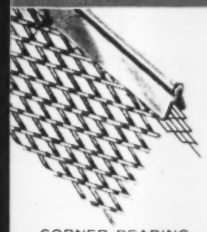
More Transportation Help To Come?

With House passage of a bill to aid the railroads (the Senate has passed a version, too), don't expect Congressional interest to die off: The Senate Surface Transportation Subcommittee, headed by Sen. George Smathers (D., Fla.), will spend $100,000 on a new study of:

1. Government assistance to all forms of transportation.
2. Consolidations and mergers.
3. Passenger service necessary for the public and national defense.
4. Federal regulations and policies.

Look for a full report by the subcommittee with legislation recommendations by early 1959.

The Shapes of Things to Come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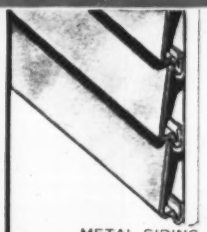
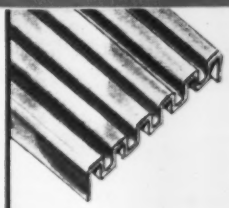
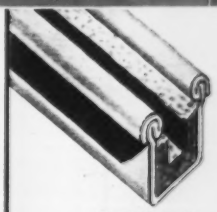
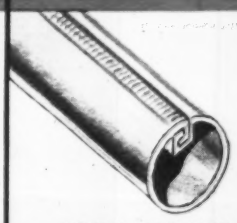

METAL SIDING


METAL DECK—FLUTING

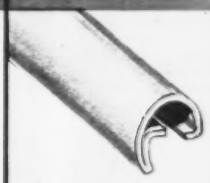
STAINLESS—GALVANIZED TRIM


AUTOMOTIVE WEATHERSTRIP

RACEWAYS

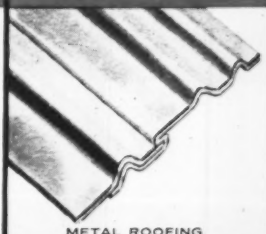

LOCK SEAM TUBING

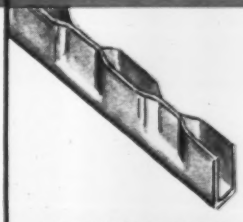
WINDOW SECTIONS


MOULDING

NAILING FLANGES

LOCK SEAM BOX SECTIONS


METAL ROOFING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McKay Forming Machines are the last word in quality. They're designed and built to perform with extreme accuracy year after year. McKay users the world over know that quality is never sacrificed, even in the smallest details, for the sake of marketing a "cheaper" unit.

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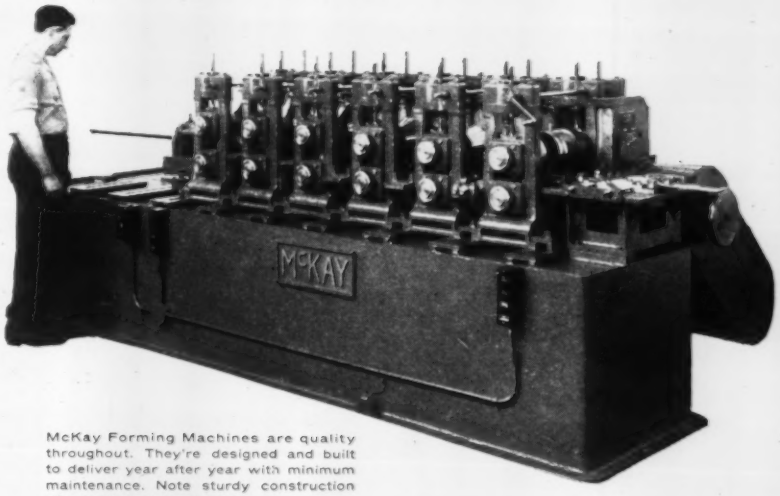
Be sure you have checked with McKay before you order forming equipment. You'll find this unmatched precision and ruggedness pays off in better forming at greatly reduced costs. And with a McKay—you're ready for tomorrow!



McKay Forming Machines are quality throughout. They're designed and built to deliver year after year with minimum maintenance. Note sturdy construction of machine pictured above.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

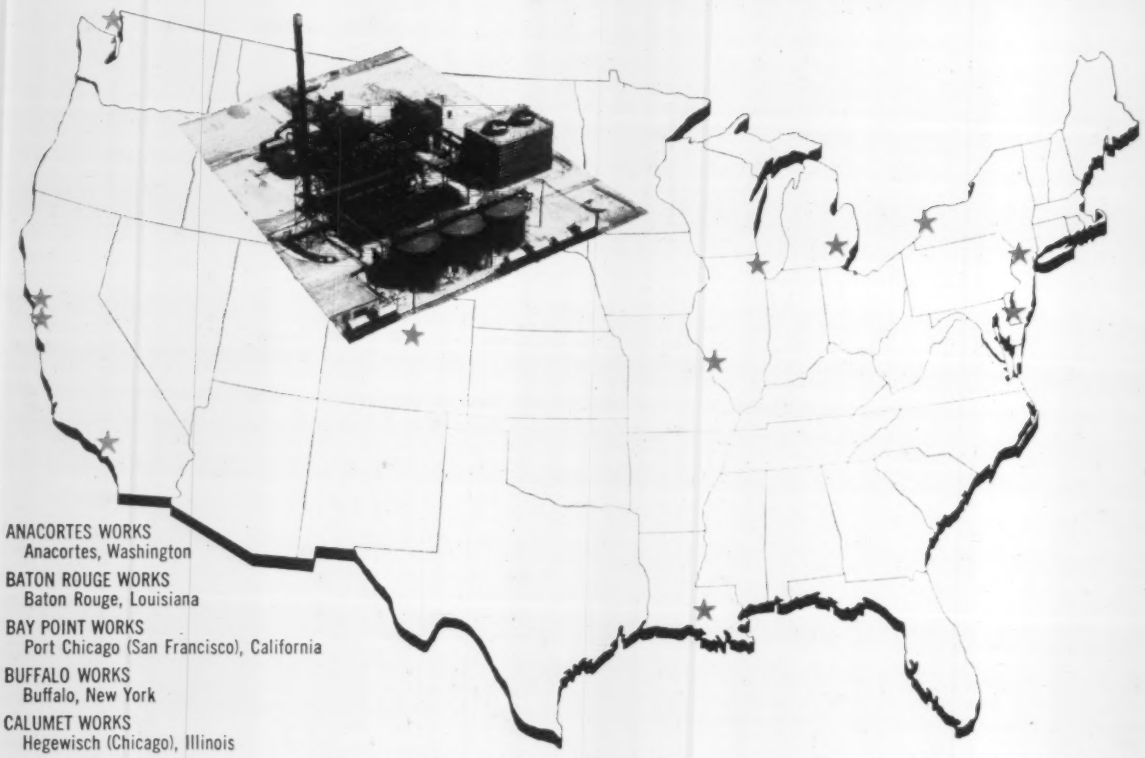
McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

An important message ***to every sulfuric user interested in spent acid recovery...***

12 GENERAL CHEMICAL Plants

are equipped to handle spent acid for you



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DENVER WORKS
Denver, Colorado

DETROIT WORKS
River Rouge, Michigan

EAST ST. LOUIS WORKS
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General Chemical provides industry with sulfuric acid from 18 producing points, located in major centers of commerce from coast to coast. Of these, 12 are equipped to handle spent acid—providing unmatched experience, service and facilities to customers interested in spent acid recovery.

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Whether we can help you or not depends on a number of factors: The acid strength . . . The nature and amounts of contaminants . . . The tonnage available . . . The distance of your location from our nearest plant. Generally, spent acids containing 70%-80% sulfuric acid, or higher, can be reclaimed if they do not contain impurities harmful to the equipment.

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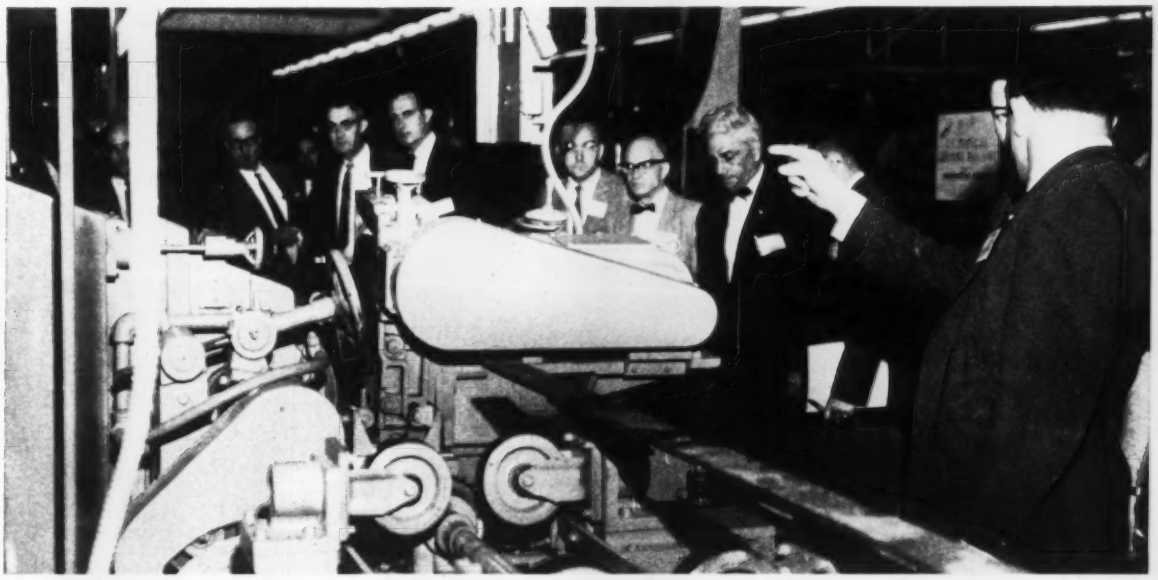

Buyers display interest in coated abrasive grinders at exhibition sponsored by Behr-Manning

Show Pays Off in Sales

Maker of coated abrasives puts first emphasis on the process. Purpose is to get customer or prospect thinking in terms of the abrasive finishing technique

SELL the process first, then your product. That's the philosophy behind Behr-Manning Corp.'s series of Coated Abrasive Machinery Shows—they cofeature machines and the coated abrasive method.

From 1954, the year of the first show, through 1957, the company's sales of small abrasive belts rose 9 per cent; sales of polishing belts soared 39 per cent; and sales of giant belts climbed 24 per cent. Henry R. Merrill, vice president of sales, says: "We attribute a large portion of this growth to the shows."

Target — The purpose: Get the customer or prospect thinking about the process in terms of his own plant. To do the job, Behr-Manning management invites builders of coated abrasive machinery to bring machines that demonstrate a wide variety of jobs.

The company invites representatives from nearly every customer or potential customer plant in the industry. (It uses its own customer and prospect list and several furnished by the machinery builders.)

The Trend—At the 1954 show in Chicago, 22 builders set up 52 machines. About 500 industry representatives came to look. In 1956, in Cleveland, 31 makers brought 67 machines, and they showed them off to over 1000 guests.

This year, in the company's plant at Troy, N. Y., 55 builders (out of 60 invited) set up 138 machines plus a host of small hand power tools and accessories. Attendance: 2097 men representing 1694 companies.

More than 400 attended Abrasive Tech, a short course designed to get the guests better acquainted with coated abrasives.

Several large company delegations, including one from General Motors Corp., held their own meetings to discuss what was being demonstrated and to interpret in terms of their own needs.

Proof—Guests are encouraged to bring in problem jobs, talk them over with specialists, and give them trial runs on the equipment.

At Troy, 67 problem projects were worked out on the equipment.

The Payoff—Behr-Manning's returns are at least one step removed —the first measure of success is the interest in the machines.

Here's how it went at Troy. Stephen Bader & Co., Valley Falls, N. Y., reports 62 machine sales and 34 solid leads during the four-day event. Delta Power Tool Div., Rockwell Mfg. Co., Pittsburgh, sold out the equipment in its booth. Many other builders reported similar success. Nine large, relatively expensive machines were sold.

Electronics Buying Jumps

Electronics buying for defense in the first nine months of fiscal 1958 was 16.8 per cent higher than it was during the same period last year, says the Electronic Industries Association.

The nine-month total was $2.863 billion, vs. the $2.451 billion spent during the same period last year.

The EIA says if the trend continues, spending for the year ended June 30 may exceed 1957's $3.5 billion.

Where U. S. Finds 250,000 New Skilled Workers Annually

1. By shifting workers with other training and experience —145,000
2. By hiring skilled immigrants —10,000
3. By using graduate apprentices —80,000
4. By employing partially trained apprentices —15,000

Sources 1 and 4 are weak; that's why . . .

More Apprentice Programs Needed

"APPRENTICE graduates are the backbone of our manufacturing team," believes A. H. Gates, manager, manufacturing training, General Electric Co.

"Apprentice training is the salvation and lifeblood of our industry," echoes a Westinghouse Electric Corp. spokesman.

Status—Such comments are common among leading industry executives, but they don't reflect the true status of this country's supply of apprentices. The situation is so serious that the Labor Department is constantly battling to promote more and better programs.

Its Bureau of Apprenticeship & Training: 1. Studies needs for skilled workers and the extent to which management, labor, and government are meeting them. 2. Publicizes outstanding programs and encourages public interest in training problems. 3. Helps management, labor, and state and community agencies set up programs. 4. Develops technical aids to increase the effectiveness of programs.

Points out A. G. Beaubien, chief of the bureau's review branch: "There has been a lot of talk about training engineers, but we haven't yet touched (on a national basis) the work area just below the engineers." Mr. Beaubien might have added: With the current trend toward handing some of the engineer's work over to the technician (STEEL, May 7, 1956, p. 53), the need for good technicians has grown.

Drawbacks—But apprentice programs still get more than their share of black eyes. Andrew La Torre of Mi-Lat Machine & Tool Co., Brooklyn, N. Y., cites these common charges: Training programs rob productive time from skilled workers who teach the recruits; trainees may leave the program or flunk out; they may be called into service; they may leave your shop for another firm.

Case Histories—To set the record straight, STEEL checked a number of companies for their experiences.

While admitting that firms sacrifice some time and money on their apprentices, Mr. La Torre asks that you look at the other side of the coin: "An apprentice also sacrifices his time and money to achieve his goal. He can certainly make more money taking a job as a nonskilled production worker."

Mr. La Torre believes: 1. It takes less time than most people think for an apprentice to become productive. 2. The apprentice will stay with you if you pay him a "reasonable" wage as a journeyman. He suggests an apprentice doesn't need to be absent for more than six months (if eligible for the draft) if he enters the active reserves. On the problem of losing trainees, Mr. La Torre thinks the company may be more at fault than the man.

How Apprentice Programs Pay Off

1. Graduate apprentices tend to remain with the company.
2. Highly skilled workers need less supervision.
3. They spoil less material.
4. Apprentice programs supply supervisory talent.
5. They provide an avenue to junior management for men without college training.
6. With upcoming skilled men, you can plan product policy shifts years ahead.
7. By establishing formal training programs, you tend to hire only the best available men because of the initial investment required.
8. Graduates take more than ordinary pride in their work; they boost everyone's morale.
9. Apprentices tend to be management oriented, rather than union oriented.

He warns: The equivalent of a high school education should be demanded of the trainee; he should be screened with an aptitude test and serve a probationary period before formally entering the program. Don't attempt to make a production worker out of a trainee so he'll be "worth his pay."

Turnover Problem — Aluminum Co. of America reports 5 per cent of its trainees leave voluntarily; 3 per cent flunk out. A spokesman suggests that an "extremely high ratio" stay with the company after completing the course. Over 15 per cent become supervisors or executives. International Harvester Co.'s tractor works has lost one apprentice in eight years and fired one. Perhaps 10 per cent eventually leave the company. Republic Steel Corp. says almost 60 per cent of its trainees complete their programs: Of those who leave, half do so voluntarily; many of the others are lost during layoff periods. Only 2 per cent are fired.

Continental Can Co. Inc. says a survey several years ago showed that only 25 per cent of its apprentices did not complete the program or left within five years after it was finished. American Can Co. notes it "rarely" fires an apprentice because of its careful screening program. Mesta Machine Co. says less than 0.5 per cent of its trainees leave or are fired. At least 95 per cent of the men it trains stay with the firm. Less than 1 per cent of Westinghouse's apprentices at its East Pittsburgh, Pa., plant quit or flunk out, and 85 per cent stay with the company after completing the program.

GE reports it has lost about 20 per cent of its trainees at its Erie, Pa., plant since 1945—most of them were drafted and went on to college. Only 5 per cent were fired. Of those completing the four-year course at Erie, 75 per cent stay on. Sums up GE's Mr. Gates: "The turnover of apprentice graduates is considerably more favorable than that of normal employees."

Armco's Plan—Speaking for Armco Steel Corp.'s Ashland (Ky.) Works, Bertram Rigg, training supervisor, notes two essential factors in any sound program: Related instruction and on-the-job training. About 10 per cent of the trainee's time at Ashland is related instruction—textbooks, demonstrations, lectures, laboratory periods, and visual aids are used.

Job rotation is a basic feature of the plan: Hours are allotted for each job within the trade the apprentice is learning. Foremen handle on-the-job supervision; an apprentice co-ordinator takes care of related instruction.

Bimonthly reports made by foremen cover the apprentice's safety habits, ability to learn, willingness to work, accuracy, productivity, and personal habits. Armco management insists that foremen make additional comments in the "remarks" section of the report.

If you are interested in refining your program, you'll receive plenty of encouragement and information from the educators in your community and the Labor Department. Dr. H. L. Bevis, chairman of the National Committee for the Development of Scientists & Engineers, is pushing for a program in which the public and educators recognize "a respectable and desirable stopping place between high school and college." Better industry apprentice programs could serve that end, he suggests. Mr. Rigg points out that industry's activities "are limited only by our imagination." The better the program, the bigger the payoff—for both the company and the trainee.

Co-operation—Because unions are highly sensitive to apprentice programs, yours won't get off the launching pad without their co-operation. Mr. Beaubien points to the success of joint apprentice committees in the construction industry. "It is the liaison group which makes the program work." Management prerogatives are not lost, he believes, with such committees; rather, they serve to solve any "misunderstandings." Getting the union to co-operate is doubly important because journeymen can sink a program when they don't understand its purpose. For 20 years, a committee at Ford Motor Co. has been helping to administer its plan under the United Automobile Workers' contract. The common interest of both parties, says Mr. Beaubien: "Unions have skills to sell; management wants those skills."

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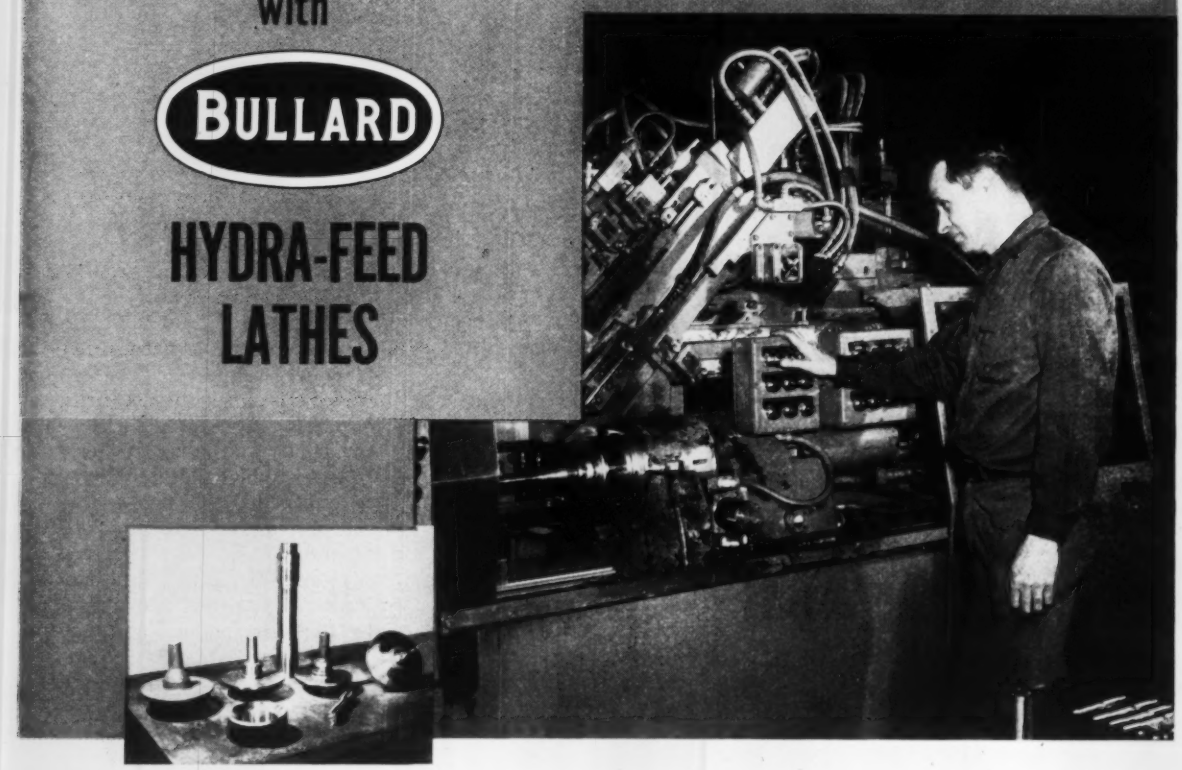

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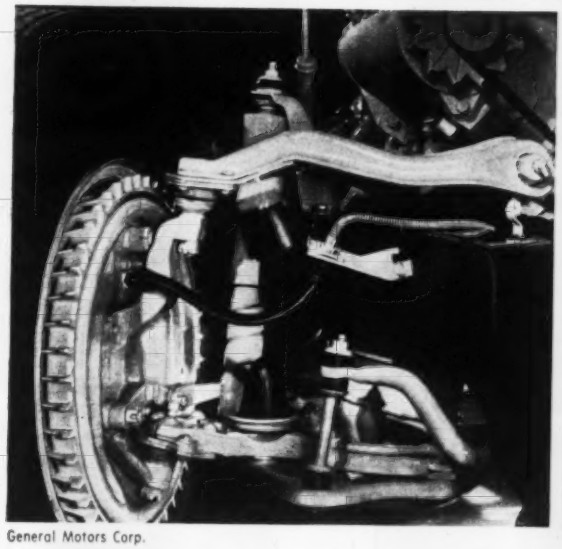

General Motors Corp.

- Wider drums
- More aluminum drums
- Slow advance in disc brakes

AUTOMAKERS KNOW they need better brakes, but they still can't beat the cost penalties involved. Next year's cars will have only modifications of present designs. Lack of adequate braking surface has been a major reason why car companies haven't gone to 13-in. wheels.

Next year, Buick will continue with its aluminum drum and Al-Fin bonded linings. Chrysler Corp., as well as another GM division, possibly Oldsmobile, is expected to switch to them. Olds is returning to 15-in. wheels to get more braking surface and to allow GM to standardize brake parts as it has body shell components. (See STEEL, May 12, p. 60.)

Rundown—The use of low profile tires on most of the premium lines will also help the stopping situation. At least two GM divisions will increase drum and shoe widths about ½ in. to get more braking surface. The self-adjusting mechanism now used on Edsels and Mercurys will be adopted for other Ford lines, and GM reportedly will have it on some medium and high priced series.

Metallic linings which Dodge and Chevrolet have been testing on police and service cars won't go into standard models. The linings are still too costly, too noisy, and wear out too quickly. But the development of them and cerametallic linings is progressing; they should be ready for '60 or '61 cars.

Temporary—Those changes are stopgap measures, engineers admit—even though auto executives stoutly maintain that brakes have kept pace with heavier cars and higher speeds.

When brakes are applied, the tremendous heat generated (over 1600° F) can cause linings to glaze and metal parts to warp or lose their strength. Unless heat can be quickly dissipated, the brakes will fail. The heavier and faster the car, the hotter the brakes get.

Example—Buick is a good example of the industry's problem. The story: It was so front-end heavy in 1956 that brakes wouldn't hold, particularly when they were used semicontinuously on hills. (Automatic transmissions help little.)

Buick was forced to finned aluminum drums which dissipate heat quicker. The switch cost about $7 per wheel—in a business where 0.25 cent per part makes a big difference.

What Now?—Builders agree that liquid-cooled brakes probably are the best solution, but they are too expensive and may not be needed when the industry goes to axle transmissions, allowing brakes to be moved inboard.

So engineers think disc brakes are the best bet for the future. High silicon alloy aluminum wheel and drum combinations are expected to appear as an interim step if premium costs can be shaved to no more than $5 to $6 per wheel. The aluminum companies think they can. Such brakes can't come before 1961-62.

Progress Report—The Big Three are testing a permanent molded, integral aluminum drum and hub in which the outer drum face is exposed for cooling. This means it will be decorative, and several designers have suggested using epoxy-

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base color washes for tinting the aluminum.

GM supposedly has priced this unit at $14 to $20 more than present brakes. Ford puts the premium at $20 per car. Chrysler is trying to find out if the wheel and drum can be diecast, but so far it doesn't seem to be having much success.

Hi-Si Better—Centrifugal casting seems to be the answer, particularly if the high silicon alloys are used. The alloys are abrasive and won't reduce machining or casting costs, but the base material price is cheaper.

One aluminum company says Ford is farthest along with this program, but prototypes are being tested for Pontiac and Oldsmobile, too. Because aluminum loses some of its physical properties quickly at high heats, designs have to include fins and air cooling. Concludes one aluminum company engineer: "Sure, the aluminum brake will cost more, but it will dissipate heat, and that's what's needed now." The aluminum brake will also reduce unsprung weight as much as 20 lb per car.

Discs Cut Costs—If the industry has to pay that much of a premium, it may be able to afford some of the disc brake designs. Such brakes generally cost at least $35 more, but Girling Ltd., England, has got the cost of its caliper disc brake down to where the difference may be less than $10.

The Girling brake is a fairly simple design. It has a U-shaped arm that fits over the disc line drum with lining pads bonded to the ends of the arm. When the brakes are applied, the pads squeeze against the drum. Its biggest advantage is that unlike drum and shoe setups, the drums expand toward the pads instead of away from them when hot. Also, more of the drum is left uncovered by the pads so cooling is improved.

Aren't Perfect—Dissenters claim this type brake is noisier and that contact is still a problem with prolonged use. But the Girling brake is being tested for U. S. Army vehicles, and International Harvester Co. is looking at it for truck use. If manufacturing costs bear out claims, the unit may find its way into passenger car production by 1963. The Triumph TR-3 has it now.

An alternating current generator for passenger cars has been announced by Delco-Remy Div., General Motors Corp., Anderson, Ind. Initially, it will be used for taxicabs, police cars, and special vehicles, but GM indicates it will be available soon on regular passenger cars. (See STEEL, May 12, p. 60.) The generator weighs 31 lb and is self-rectifying. It will deliver 26 amperes when the engine is idling and up to 60 amperes at higher speeds.

With the generator, Delco-Remy has developed an electronic voltage regulator which has no moving parts. The combined units will eliminate regulator adjustments, increase the life of batteries and generator brushes, and furnish all the electrical power needed even at slow speeds—an important advantage because electrical requirements have increased nearly 600 per cent since 1938, says Donald L. Boyes, Delco-Remy's general manager.

Fin Fight Looms Again

The great tail fin controversy may be renewed. Darrell Hosler, an engineering student at Kansas State College, Manhattan, Kans., told members of the American Society of Mechanical Engineers that his wind tunnel tests indicate that the largest finned cars are 2.68 times as unstable as finless automobiles.

The observation should get a reply from Chrysler Corp. which conducted many tests and spent much time trying to convince the industry and a Senate subcommittee investigating auto safety that tail fins aid stability.

Mr. Hosler's paper, a prizewinner in an ASME contest, points out that if there were no gusts of side wind, fins might be helpful. But under usual driving conditons, fins act like sail: The higher the sail—or fin—the less stability.

Concludes Mr. Hosler: "Unless tail fins are redesigned to reduce the magnitude of these aerodynamic forces which lead to instability, they cannot be justified on grounds of safety or economy." It will be interesting to see whether the industry—which will be "finnier" than ever next year—will attempt to refute Mr. Hosler's claims.

U. S. Auto Output

	Passenger Only 1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	325,300†	500,271
6 Mo. Total	2,229,795†	3,372,889
July		495,629
August		524,354
September		284,265
October		327,362
November		578,601
December		534,714
Total		6,117,814

Week Ended	1958	1957
May 31	66,574	82,431
June 7	73,696	129,517
June 14	78,163	125,372
June 21	84,396	118,805
June 28	92,338†	125,909
July 5	50,000*	73,682

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

Exhaust Notes

• Plans for Chevrolet's small car reportedly are in Fisher Body Div.'s pattern shop, and work will begin shortly. Industry sources confirm that some body tooling is being done in GM captive shops and some in foreign shops. Ford apparently has not committed itself.

• Toyota Motors Ltd., Tokyo, says it will introduce its small car, the Toyopet, in the U. S. on July 11.

• Auto introduction dates: Buick—mid-September; Oldsmobile—mid-September; Cadillac—late September; Chevrolet—early October; Pontiac—mid-October; Ford—late October; Mercury, Lincoln, and Edsel—mid-November; Chrysler Corp. (all cars)—mid-October; American Motors (all cars)—mid-October; Studebaker-Packard (all cars)—mid-November.

• Replacement tire shipments for passenger cars are 1 per cent ahead of those in the first five months of last year. May and June estimates are higher and indicate 1958 may break last year's record shipments of 56,605,037 tires.

• Ford Div. reports 18,702 Ford trucks were sold during May, 6 per cent above previous month totals. The Ford company says it has been awarded a $500,000 military contract to build prototypes of a ¾ ton, six wheel drive utility truck.

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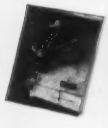

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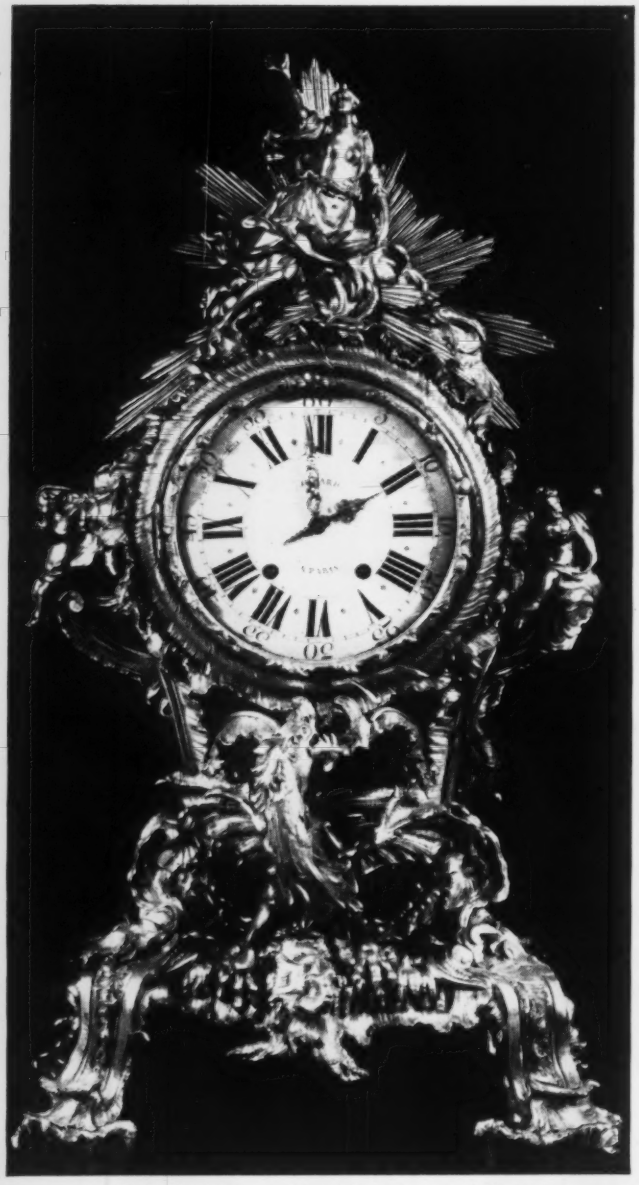

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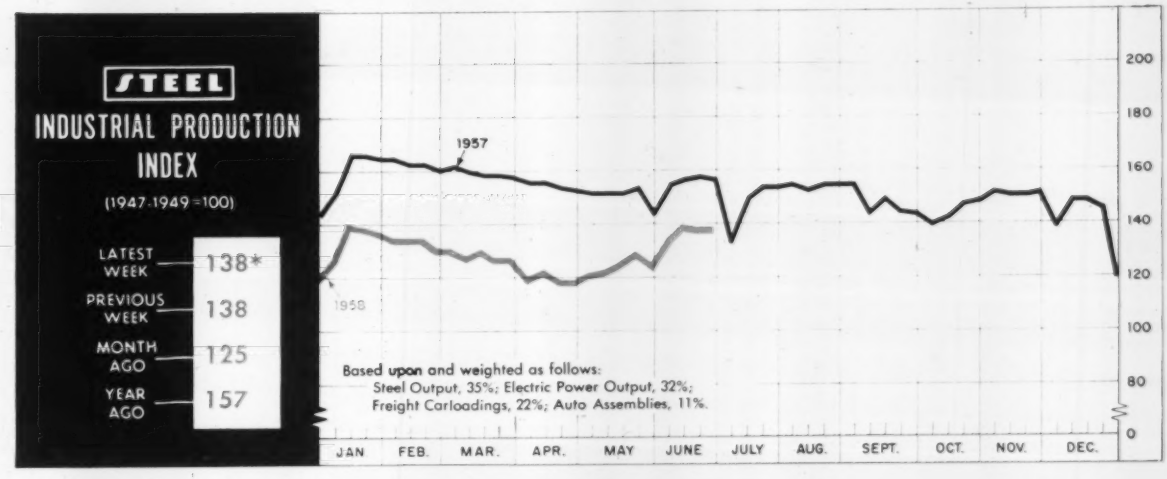

*Week ended June 28.

Summer Sets in, Halting Spring Upturn

THE SPRING UPTREND is over, but the year's second upswing may come sooner than many expect.

The summer doldrums have already influenced business trends, and July will probably be the slowest month of the summer. But it is doubtful that it will drop to the April low point. Right now it looks as if August will be a bit better than July, with the real beginnings of the road back up coming in September.

Narrow Range—STEEL's industrial production index, revised for the week ended June 21 and estimated for the week ended June 28, settled back slightly to 138 (1947-49=100). Advances in auto production and rail freight loadings were not quite enough to counterbalance declines in electric energy output and steel production during the latest period.

Auto producers closed out June on the strongest note since the last week in March. Assemblies during the June 28 week totaled almost 109,000 cars and trucks. With July 4 causing a cutback last week and the start of model changeover contracting schedules for the next two or three months, there is no chance of improving upon that figure until all producers are geared to 1959 production in September or October.

Shift in Plans—Motordom's cutback this summer may not be as drastic as many businessmen feared earlier this spring. The rise in sales during May and June may delay the phase out at some plants. Inventories are coming down faster than anticipated, and producers have no intention of being caught short on stocks in case of labor troubles at model introduction time.

Further indication of a change in motordom's plans is the report from some steelmakers that July bookings from auto companies are heavier than expected. One steel official says that if the July trend continues into the last half of the month, his company will operate at a level only slightly below that of June. But he

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,423[1]	1,666	2,009
Electric Power Distributed (million kw-hr)	12,000[1]	11,941	12,111
Bituminous Coal Output (1000 tons)	8,775[1]	8,370	10,180
Crude Oil Production (daily avg—1000 bbl)	6,325[1]	6,345	7,190
Construction Volume (*ENR*—millions)	$483.1	$429.9	$330.1
Auto, Truck Output, U. S., Canada (*Ward's*)	118,105[1]	110,538	160,386
TRADE			
Freight Carloadings (1000 cars)	625[1]	628	732
Business Failures (Dun & Bradstreet)	290	254	241
Currency in Circulation (millions)[3]	$30,975	$31,052	$30,849
Dept. Store Sales (changes from year ago)[4]	−9%	−1%	+9%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$27,667	$28,592	$23,562
Federal Gross Debt (billions)	$276.3	$275.9	$270.5
Bond Volume, NYSE (millions)	$25.1	$26.6	$21.8
Stocks Sales, NYSE (thousands of shares)	13,334	13,732	9,486
Loans and Investments (billions)[4]	$96.0	$93.5	$87.7
U. S. Govt. Obligations Held (billions)[4]	$32.4	$31.2	$25.6
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	228.59
STEEL's Nonferrous Metal Price Index[6]	197.6	197.6	218.0
All Commodities[7]	119.1	119.0	117.1
Commodities Other than Farm & Foods[7]	125.2	125.2	125.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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6. Indigestion or difficulty in swallowing.
7. Change in a wart or mole.

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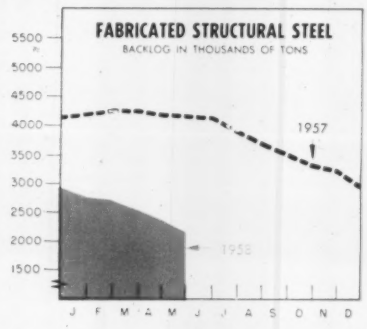
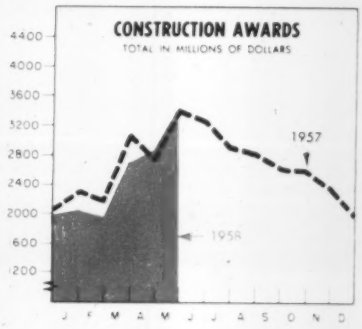




	Shipments		Backlogs	
	1958	1957	1958	1957
Jan.	316.7	290.1	2,778	4,194
Feb.	282.6	319.0	2,727	4,262
Mar.	336.6	342.4	2,542	4,245
Apr.	323.6	362.2	2,387	4,192
May	328.2	377.3	2,211	4,172
June		384.7		4,134
July		342.5		3,907
Aug.		383.8		3,707
Sept.		338.6		3,521
Oct.		384.8		3,322
Nov.		334.1		3,233
Dec.		320.2		2,959
Total		4,179.7		

American Institute of Steel Construction.
Charts copyright, 1958, STEEL.

	Total		Building	
	1958	1957	1958	1957
Jan.	2,066.1	2,299.6	1,536.2	1,730.7
Feb.	1,953.4	2,161.0	1,478.1	1,695.5
Mar.	2,721.2	3,078.0	2,037.7	2,199.7
Apr.	2,881.0	2,776.4	2,198.0	2,069.7
May	3,402.6	3,399.5	2,470.3	2,416.8
June		3,243.5		2,341.5
July		2,900.7		2,247.6
Aug.		2,818.0		2,291.8
Sept.		2,624.9		2,092.2
Oct.		2,613.8		2,075.6
Nov.		2,370.7		1,808.5
Dec.		1,982.3		1,457.5
Totals		32,268.4		24,427.1

F. W. Dodge Corp.

cautions: "We've had other months this year that started out like this only because practically all the orders were placed in the first two weeks."

Some Slippage Due — On the whole, the industry's operating rate will probably dip to about the May level because of vacation shutdowns. Construction demand for steel will be one of the strongest props during the summer, as indicated by the latest figures from the American Institute of Steel Construction Inc. (See chart and table above.) Shipments of fabricated structural steel for the first five months of 1958 are only 6 per cent below the corresponding year-ago mark. There is still a good-sized backlog, and bookings during May were the highest since June, 1957.

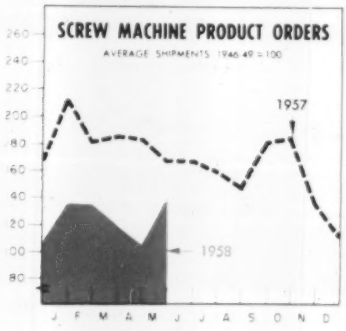
The industrial slowdown and unseasonably cool weather over a large portion of the nation will weaken the influence of electricity output on the industrial production index this summer. Freight carloadings may help offset this factor, though. Much of the present uptrend is accounted for by coal and iron ore loadings, but later in the summer bumper grain crops will be the dominating force.

How Much?—Judging from past performance, the index could drop 5 to 15 per cent over the holiday week. If the 1954 pattern is followed, and there is reason to believe it will be, the index will skid to about 130. It will come back up about halfway during the rest of the month, then show a gradual rise in August.

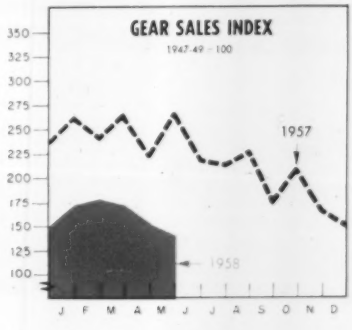
Construction Sets Record

Construction seems destined to play the same role in the 1958 recovery as it did in 1954. Not only is current work holding up well, but the future is more promising than it has been for some months. Contracts in May set a monthly record of more than $3.4 billion, states F. W. Dodge Corp. The previous high was set in May, 1957. (See chart and table above.) Although total contract awards for the first five months of 1957 are still 5 per cent behind the figures for a year ago, the difference has been reduced steadily the last three months.

Of special importance in the May figures is the 4 per cent rise in dollar value of residential construction over that of May, 1957. Not only is the dollar total up, but the number of dwelling units—104,048— is the largest in two years. Nonresi-



	New Orders		Shipments	
	1958	1957	1958	1957
Jan.	138	211	165	206
Feb.	137	181	145	185
Mar.	122	185	141	197
Apr.	108	183	141	193
May	140	167	137	192
June	...	166	...	173
July	...	159	...	139
Aug.	...	147	...	173
Sept.	...	181	...	168
Oct.	...	184	...	184
Nov.	...	135	...	159
Dec.	...	110	...	144
Avg	...	167	...	176



	1958	1957	1956	1955
Jan.	174.5	259.3	245.5	140.9
Feb.	179.1	239.5	256.2	148.5
Mar.	173.7	262.4	276.5	172.8
Apr.	153.2	221.7	264.7	179.8
May	142.2	263.2	275.6	205.2
June	....	215.9	245.4	193.5
July	....	211.4	286.7	201.7
Aug.	....	225.8	219.5	217.6
Sept.	....	174.9	230.5	246.5
Oct.	....	207.0	299.8	227.6
Nov.	....	165.3	216.2	210.4
Dec.	....	150.8	235.7	245.5
Avg	....	216.4	254.4	198.3

American Gear Mfrs. Assn.

dential building was up less than 1 per cent despite a lag in commercial, factory, and educational building.

Second Half Looks Good

Makers of factory-built homes are looking forward to a record-breaking second half. The first half was far above the similar period last year, reports the Home Manufacturers Association, and if things go as planned, this year will see production of more than 100,000 units. That's about 10 per cent of the anticipated home market this year.

George E. Price, president of National Homes Corp., Lafayette, Ind., predicts a 46 per cent increase for his company this half, compared with 1957's second half.

Business Trends Mixed

But for most of metalworking, the outlook is still anything but bright. Two industries which are usually leaders in any general upturn report divergent trends for May, their latest month of record. The National Screw Machine Products Association's new order index reversed itself—at least temporarily—for the first time in five months with the largest gain since last December. (See chart above.) Going in the opposite direction was the American Gear Manufacturers Association's sales index, which was off the April reading by about 7 per cent (see chart above).

The May report of the Resistance Welder Manufacturers' Association typifies the situation in capital goods industries. New orders dropped to $1.1 million, the lowest point since these figures have been collected.

It should be noted that for about eight months prior to April or May, practically all metalworking trends were downgrading. The mixed pattern since that time indicates that the bottom may be in sight for even the hardest hit industries.

PAs Note Slowdown

Reporting members of the National Association of Purchasing Agents feel that the improvement first noted in April continued into June but at a slower pace. More members report better order and production positions than at any time since the recession began. But the majority look for no major breakthrough before the end of 1958 or early in 1959.

Coming

July 14

IN

STEEL

Finding Out What Customers Will Buy

The new concept of marketing rests on knowing what the customer will buy, what price he will pay, when he wants the product, and what size and color he wants.

How do manufacturers learn the answers to these questions? What comes first—the product or the market? Should you do your own market research, or hire it done?

STEEL's next Program for Management article, July 14, will point out how the customer, sometimes neglected in boom periods, is all important. The company that expects to make a profit will have to get to know him and his wants better. The July 14 story will tell how.

Engineered by Tinnerman...

3-way savings for Chrysler Corporation when one **SPEED NUT**® replaced 5 parts

Four parts eliminated...

Parts cost reduced 40%...

Assembly costs cut 12%...

All these savings were accomplished when the Chrysler Corporation switched to a Tinnerman-engineered SPEED NUT Brand Fastener developed to hold car and truck window vents in place. The all-spring-steel fastener serves as a friction brake to hold the vent at any desired position.

You, too, can achieve savings like these on parts for your assemblies . . . a no-obligation Tinnerman SPEED NUT Fastening Analysis will quickly locate the places. Your Tinnerman sales representative will discuss your problem, arrange for the Analysis. He's listed in your Yellow Pages under "Fasteners." Or write to:

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THOMAS J. AULT
Saco-Lowell Shops president

LOUIS R. GALLAS
Promat Div. sales mgr.

LEON B. WOHLGEMUTH
B&W tubular products sales

AUSTIN K. THOMAS
joins Blaw-Knox

Thomas J. Ault, former president of several divisions of Borg-Warner Corp., was elected president of **Saco-Lowell Shops**, Boston. He succeeds **Malcolm D. Shaffner**, now chairman. **David F. Edwards**, former chairman, was made honorary chairman.

Louis R. Gallas was made sales manager, **Promat Div.**, Poor & Co., Waukegan, Ill.

George W. Fenimore was made assistant vice president, **Ramo-Wooldridge Corp.**, Los Angeles. He was plant manager in Denver. Function of plant manager and senior company representative in Denver are taken over by **I. A. Binder**, vice president-manufacturing.

Harris Shapiro joined **Electro Dynamic Div.**, General Dynamics Corp., at Bayonne, N. J., as assistant division manager, in charge of engineering. He was chief engineer, Star-Kimble Motor Div., Safety Industries Inc.

John G. Cumming was made manager of **A. M. Byers Co.'s** southwestern division, Houston.

Donald W. Matzen was appointed purchasing agent for the service parts and accessories supply division, **Chrysler Corp.**, Detroit. He was purchasing agent for the De Soto Div.

Alex N. Telischak was named purchasing agent, Thomas A. Edison Industries, **McGraw-Edison Co.**, West Orange, N. J. He succeeds **Valentine M. Meade**, retired.

Leon B. Wohlgemuth was made general sales manager, tubular products division, **Babcock & Wilcox Co.**, Beaver Falls, Pa. He was sales manager, middle states district sales offices.

N. Harvey Collisson was elected president of **Ormet Corp.**, New York, primary aluminum producing company jointly owned by Olin Mathieson Chemical Corp. and Revere Copper & Brass Inc. He was corporate vice president of Olin Mathieson for production and engineering. Mr. Collisson succeeds **Walter F. O'Connell**, who becomes **Olin Mathieson** corporate vice president-finance.

John P. Cartwright was elected vice president and general manager, industrial division, **Joy Mfg. Co.**, Pittsburgh. He is succeeded by **J. Y. Richards** as sales manager, industrial division.

Harold G. Ingersoll Jr. was elected president and general manager, **Ingersoll Steel Div.**, New Castle, Ind., Borg-Warner Corp. Former executive vice president and general manager, he succeeds **L. G. Porter**, now chairman of the division's supervisory board. Mr. Porter is executive vice president of Borg-Warner. **Howard E. Morison**, Ingersoll vice president, was made executive vice president.

John W. Mayers was promoted to chief engineer, **Pittsburgh Coke & Chemical Co.**, Pittsburgh. He is responsible for design, construction, and engineering activities of the company's plant facilities.

Austin K. Thomas joined **Blaw-Knox Co.**, Pittsburgh, as general manager of construction equipment, a new post. He is responsible for sales, market planning, and advanced engineering of the company's line of construction and road building equipment.

John Wambold was made chief metallurgist, **Alloy Surfaces Co.**, Wilmington, Del. He was with Wright Aeronautical Div., Curtiss-Wright Corp., and more recently was associated with Kennametal Inc.

Donald V. Sarbach was named director of new product development for **Goodrich-Gulf Chemicals Inc.**, Cleveland. He was director of research at Hewitt-Robbins Inc. Mr. Sarbach will set up a laboratory for Goodrich-Gulf at its Institute, W. Va., plant.

Nicholas Chernik was made assistant chief metallurgist, **Alloy Tube Div.**, Carpenter Steel Co., Union, N. J.

Trane Co., La Crosse, Wis., promoted **John B. Custer** to manager, aircraft heat exchanger sales department; **William H. Stahlheber** to manager, process heat exchanger sales department.

E. G. Bowerman Jr. was made sales manager of **Bearings Inc.**, Cleveland. He was manager of the Pittsburgh branch.

R. H. Colin was appointed director of production chemistry, **United States Steel Corp.**, Pittsburgh. He also will serve as chairman of the

WILSON P. BURNS

LAWRENCE G. BLACKMON

National Malleable & Steel Castings works manager

GARLAND W. REESE

ROBERT B. THOMPSON

American Can manufacturing posts

chemists' committee. Mr. Colin was chief chemist at the Duquesne Works.

Wilson P. Burns was named manager of the Cleveland works of **National Malleable & Steel Castings Co.** to replace **Stewart Tame**, retired. **Lawrence G. Blackmon** replaces Mr. Burns as general superintendent, Sharon, Pa., works.

A. L. W. Williams was elected a vice president of **Clevite Corp.**, Cleveland. He was in charge of the corporation's research center in Cleveland. Operations of the center are now governed by **Hans Jaffe** as director of electronics research; and **Arthur D. Schwope** as director of mechanical research.

Eugene G. Bates was made southern district sales manager for the Steelweld line of press brakes, heavy metal-cutting shears, and straight-side presses of **Cleveland Crane & Engineering Co.**, Wickliffe, Ohio.

John W. Holzwarth was made manager of **Electric Furnace Co.'s** new western district office at 312 E. 17th St., Santa Ana, Calif.

Commercial Controls Corp., Rochester, N. Y., appointed two managers: **Albert E. Bartlett**, new finished machining department; **Milton W. Zarpentine**, new punch assembly department.

Robert N. Wagner was made chief electrical engineer for **Aluminum Co. of America**, Pittsburgh. He succeeds **Louis N. Grier**, retired.

John Burt was named national technical sales manager, **Voi-Shan Mfg. Co.**, Los Angeles.

Garland W. Reese was elected a vice president, assigned to the executive department of **American Can Co.**, New York. He is succeeded by **Robert B. Thompson** as vice president-manufacture, Canco Div. **Leonard A. Britzke** succeeds Mr. Thompson as general manager-manufacture for the division. Mr. Britzke was president of Bradley Container Corp., American Can subsidiary.

Lewis V. Smith was appointed Cleveland district sales manger for **Robertshaw Thermostat Div.**, Robertshaw-Fulton Controls Co.

August J. McDonald was named chairman and chief executive officer of **Steel Fabricators Corp.**, San Diego, Calif.

John Madison was named director of manufacturing and quality control for **Riverside Iron Works**, Riverside, Calif.

Charles T. Fettel replaces **William H. Boyle**, retired, as superintendent of the merchant-skelp mill at **Kaiser Steel Corp.**, Fontana, Calif., plant.

Charles A. Wagner was named Philadelphia district manager, wire rope division, **John A. Roebling's Sons Corp.** He succeeds **John P. Kadlic**, recently made head of the division's New York operation.

J. Justin Basch was made marketing vice president, **Oakite Products Inc.**, New York. He was vice president-research and product development.

John F. Kotchian, **Charles M. Richardson**, and **William F. Fischer** were appointed district managers, respectively, for **Lincoln Electric Co.**'s North Haven, Conn.; Franklin, Pa.; and Phoenix, Ariz., offices.

Frederick E. Allison Jr. was made manager of **Latrobe Steel Co.**'s new branch office in St. Louis. He was Chicago district manager.

Harvey G. Knuth was appointed manager, new product research department, **Lyon Metal Products**, with headquarters in Aurora, Ill.

C. H. Leet, former Chicago area industrial sales branch official, was named to head a national marketing program for **Exide Industrial Div.**, Electric Storage Battery Co., Philadelphia.

C. C. Brumbaugh was appointed a vice president, **Diamond Alkali Co.**, Cleveland, in charge of engineering, research, and related technical aspects. He is succeeded as director of engineering by **Robert C. Sutter**, former operations manager, chlorinated products division.

Louis V. Hollerbach was appointed purchasing agent for **Kaiser-Nelson Co.**, Cleveland. He was with the purchasing department of Cleveland-Cliffs Iron Co.

Corneille O. Strother was appointed vice president-research, **Union Carbide Nuclear Co.**, division of Union Carbide Corp., New York.

Lyle B. Schueler, former vice president-sales, Diamond Power Specialty Corp., has been retained by **Cooper-Bessemer Corp.**, Mt. Vernon, Ohio, as power market consultant.

Pinckney B. Reed was named to the new post of vice president-educational electronics, **Radio Corp. of**

At Westinghouse, production men agree on economy of Wean coil processing

Mr. M. W. Stretch, right, of the Manufacturing Planning Department, and his assistant, Mr. M. Avery, discuss Wean's slitting line "after hours."

Until recently, the Electric Appliance Division plant of Westinghouse Electric at Columbus, Ohio was supplying its production lines with steel purchased in sheet form and individually resquared. Some 75 sheet sizes had to be stocked to meet varying requirements.

The installation of Wean slitting and shearing lines in August, 1957 was made after a careful cost analysis of this production process. Now, after five months operating experience, here is how production management at this Westinghouse plant summarizes the advantages of the Wean coil processing system:

Materials Savings: in addition to the initial savings realized by the purchase of coil rather than sheet, scrap is reduced by the close control and accuracy possible on Wean slitting and shearing equipment. Coil is slit in a variety of widths, from 3 to 48 inches, to supply both the shearing line and press lines, now being coil-fed.

Inventory Savings: 3 or 4 standard coil sizes now provide the production flexibility for which 75 sizes of mill-prepared sheet were previously required. In addition, prime plant space for sheet production and storage has been reduced and inventory turnover increased.

Low-Cost Versatility: differing assembly line requirements for sheet are now met quickly and easily, without production delay or the expense of special purchases.

The mechanized handling of metal possible with the Wean slitting and shearing lines also has reduced direct labor costs, freeing men for work in other production departments. And the production rate of the Wean system is more than adequate to match the plant's usage of coil and sheet: in one three-day period, 350 tons of coil were processed on the shearing line.

If you use sheet steel in quantity, it's likely that these same savings could result from your plant's use of Wean slitting and shearing equipment. One of our experienced sales engineers will be glad to explore with you the economics of processing from coil to fill your production requirements. May we hear from you?

WEAN

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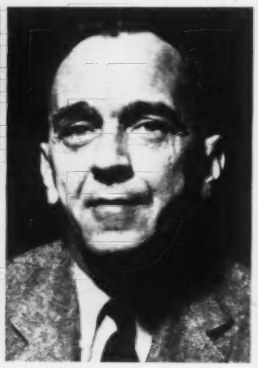
WERNER PFLUG
National Carbide Die v. p.

A. I. NUSSBAUM
Loma Machine v. p.

EDWARD J. TANGREDI
Reynolds Metals sales post

RICHARD Y. MOSS
Lukens Steel sales post



RALPH L. CHAMBERLIN
Research-Cottrell eng. dir.

HENRY E. PRUNER
U. S. Rubber div. marketing

America, New York, effective Aug. 1.

Lukens Steel Co., Coatesville, Pa., appointed **Richard Y. Moss** manager of byproducts and Lukenweld fabrication sales to succeed **Edmund Pfeifer**, who was promoted to director of purchases. **Lot Seacat** was named assistant controller-management services. Mr. Moss was with E. W. Bliss Co.

Ralph L. Chamberlin was appointed director of engineering, **Research-Cottrell Inc.**, Bound Brook, N. J.

Walter M. Kay was made sales manager, Philadelphia area, for **Republic Mfg. Co.**, Cleveland.

Charles Hardy Inc., New York, appointed **Dr. Henry H. Hausner** scientific adviser on powder metallurgy development. He is adjunct professor of metallurgy at Polytechnic Institute of Brooklyn, N. Y., and works under contract with the Atomic Energy Commission on studies of powder metallurgy materials and processing.

Henry E. Pruner was appointed marketing manager, mechanical goods division, **United States Rubber Co.**, New York. He was western regional sales manager and manager of conveyor and elevator belting sales.

Henry B. Yarbrough was appointed to the new post of general sales manager, Cincinnati division, **Bendix Aviation Corp.**

Paul C. Bailey was named manager of sales and manufacturing, brass division, **Bohn Aluminum & Brass Corp.**, Detroit.

H. C. Emerson was named general superintendent of production, Chula Vista, Calif., plant, **Rohr Aircraft Corp.** He was tool superintendent.

Tung K. Lau was made chief engineer, **Thermobloc Div.**, Prat-Daniel Corp., South Norwalk, Conn.

J. B. Sewell was elected president, **Garlock Packing Co. of Canada Ltd.**, subsidiary of Garlock Packing Co., Palmyra, N. Y. He continues headquarters in Palmyra.

Werner Pflug was appointed vice president, **National Carbide Die Co.**, McKeesport, Pa. He had been with Adamas Carbide Corp.

A. I. Nussbaum was appointed vice president, **Loma Machine Mfg. Co.**, New York, and its affiliate company, **Lobeck Casting Processes Inc.** He joined Loma in 1956 as manager of its rolling mill division, having previously held a similar position with Stanat Mfg. Co.

Edward J. Tangredi was named director of monumental and general construction sales for **Reynolds Metals Co.**, Richmond, Va. He was chief engineer for Webb & Knapp. **Heinz V. Menking** was named general director of product development to succeed **George Perkins**, resigned.

Robert S. Hoar was appointed vice president; **Harold P. Paul**, assistant secretary-treasurer, **Boyles Galvanizing & Plating Co.**, Hurst, Tex.

OBITUARIES...

Meyer Dry, 68, founder and president, **National Steel Container Corp.**, Chicago, died June 21.

Harry C. Smith Jr., 49, district sales manager, **National Steel Corp.**, Chicago, died June 24.

William J. Healy, 60, sales manager for the blower and compressor, and the turbine divisions of **De Laval Steam Turbine Co.**, Trenton, N. J., died June 3.

Paul H. Van Osdol, 50, assistant service manager, construction machinery division, **Allis-Chalmers Mfg. Co.**, Milwaukee, died June 21.

Ralph R. Hicks, 70, vice president and a founder of **Bagwell Steel Co.**, Bessemer, Ala., died recently.

Edward T. Day, 51, former general sales manager, mechanical goods division, **United States Rubber Co.**, New York, died June 17.

Robert McC. Johnstone, 66, head of **Johnstone Engineering & Machine Co.**, Parkesburg, Pa., died June 22.

John H. Kincaid, 64, chief engineer and assistant vice president, **Wellman Engineering Co.**, Cleveland, died June 26.

Let us demonstrate — right in your plant or shop — how 'Budgit' Hoists can make your lifting problems disappear.

Free Demonstration

IN YOUR PLANT OR SHOP

Make us prove how 'Budgit' Hoist can solve YOUR lifting problem

Your local 'Budgit' Electric Hoist distributor now makes you this special offer:

You pick the spot where you need help in lifting.

Call your 'Budgit' Hoist distributor. (You'll find him listed in the yellow pages under 'Budgit'.)

He'll bring a 'Budgit' Hoist to the spot you name, hang it up, plug it in, and show you how 'Budgit' can make your lifting job fast, safe and effortless.

No obligation. Demonstration takes only minutes. All you need is a place to hang the Hoist and an electrical outlet (or 12-volt battery).

HANDLES ANY LOAD

The 'Budgit' Electric Hoist can handle any kind of load up to 2 tons: machinery units, castings, crates, dies, pipe . . . anything. Works indoors or out. Has two automatic brakes for extra safety. Either alone can hold the load.

One-hand control leaves your other hand free to guide the load. Hairline stops and starts let you "spot" your load gently within 1/100th of an inch.

AC and DC models. Also 12-volt battery models for use on trucks. Prices start at $159.

Call your Shaw-Box distributor today or write for your copy of Bulletin 402 and 404. No obligation of course.

58A-2

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MANNING, MAXWELL & MOORE, INC.

SHAW-BOX CRANE & HOIST DIVISION

384 **West Broadway • Muskegon, Michigan**

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario.*

J&L Forms Stainless & Strip Div.

Two specialty divisions are consolidated into a single production and marketing unit

JONES & LAUGHLIN Steel Corp., Pittsburgh, organized a Stainless & Strip Div. through merger of its Stainless Steel and Strip Steel divisions.

The Stainless Steel Div. (formerly Rotary Electric Steel Co.) operates a Detroit plant in the production of stainless, alloy, and special grade ingots, slabs, billets, hot-rolled and cold-finished bars, rods, and wire. Construction of a $16-million plant for the division will be completed next month at Louisville, Ohio. Its annual capacity will be about 36,000 tons of stainless steel sheets and strip.

The Strip Steel Div. (formerly Cold Metal Products Co.) operates plants in Youngstown and Indianapolis. It gave J&L entrance into the "restricted specification" cold-rolled strip steel market. The division operates warehouses in Kenilworth, N. J., and Los Angeles which also have facilities for limited production of cold-rolled strip.

General Managers — Sales forces and district sales offices of the two divisions are being consolidated. Appointments for the combined division are John H. Abbott, vice president-sales, and H. N. Steinberger, general sales manager. J. T. Bachman has been named general manager of the former Strip Div.

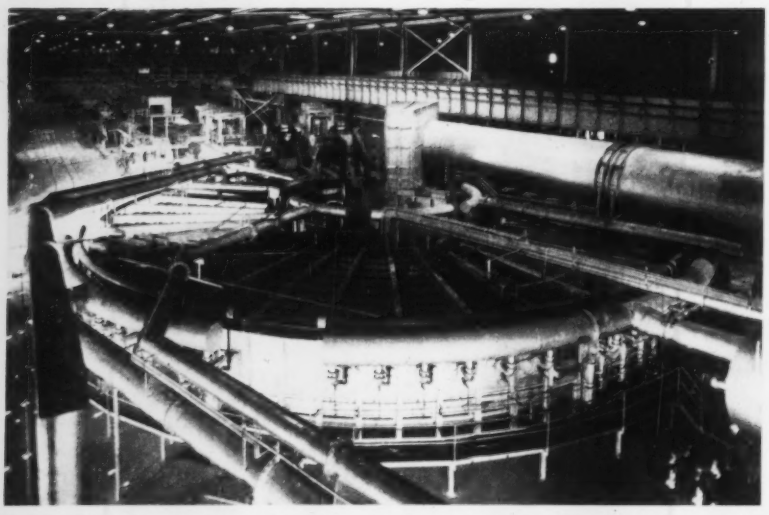
District Managers—Operation of six district sales offices will be combined. T. G. Kuzma will be district sales manager at 12301 Hubbell Ave., Detroit 27, Mich.; D. L. Cooke, eastern district sales office, Raymond Commerce Bldg., Raymond Boulevard, Newark, N. J.; M. C. Shields, 4010 W. Madison St., Chicago 2, Ill.; L. B. Warstler, 2301 S. Holt Rd., Indianapolis 41, Ind.; W. C. Thompson, Leader Bldg., Cleveland 14, Ohio; John Cottier Jr., 2975 Wilshire Blvd., Los Angeles 5, Calif. Assistant district sales managers will be W. H. Rees at Newark, Jack Collins at Chicago, and R. K. Dykema Jr. at Cleveland.

Installs Roughing Train

Kaiser Steel Corp. has installed an 86-in. hot strip mill roughing train and integrated it with a finishing train at its Fontana (Calif.) Works. The new facility was built by Mesta Machine Co., Pittsburgh.

The entire installation will consist of 12 stands and includes slab loading tables with magazine unpiler; slab return transfer; reheat furnace charging and delivery tables and equipment; a scale breaker; a 136 in., four high, spreading stand with front and rear turnaround; a slab squeezer; and four 89 in., four high, universal roughers with vertical edging mills and intermediate tables.

Mesta also will provide the 232-ft roughing mill runout table, a 352-ft mill runout table for the finishing stands, grease and oil lubrication systems, and roll balance and descaling equipment.



LARGE ROTARY FURNACE with six heating zones is used in pushbutton production of seamless pipe at the modern mill of Youngstown Sheet & Tube Co., Chicago. It heats 190 billets an hour to an operating temperature of 2250° F. The facility, put into operation a few months ago, produces pipe 4½ to 9⅝ in. OD

United Steel Renamed

United Steel Products Corp., Los Angeles, changed its name to United Pacific Aluminum Corp. The firm makes basic aluminum coils and precoated aluminum strip.

Foundry Changes Hands

Bay City Foundry Co., Bay City, Mich., has been acquired and will be operated by Jack Bean, president; Harold Schroeder, vice president; and Philip G. Smith, secretary-treasurer. The firm produces gray iron, alloy iron, and ductile iron castings. The new owners plan to expand facilities.

Ups Silica Brick Capacity

Silica brick production at the Canon City (Colo.) Works of Refractories Div., H. K. Porter Company Inc., has increased more than 50 per cent with the installation of 31 major pieces of equipment and a modernized electrical system.

Opens Canadian Factory

Packaged air conditioning units, previously imported from the U. S., are being manufactured at Galt, Ont., by B. F. Sturtevant Co., a subsidiary of Canadian Westinghouse Co. Ltd., Hamilton, Ont.

Granite City Steel Builds

Granite City Steel Co. is erecting an 86,000 sq ft building in downtown Granite City, Ill., that will house its main offices and the First Granite City National Bank. The decision to build reflects the success of a campaign by industry, construction labor, and contractors

to improve construction practices in the East Side Industrial district, of which Granite City is a part. The ten-point "Statement of Policy" prohibits featherbedding practices and sets up procedures intended to eliminate jurisdictional strikes.

Tomkins-Johnson Expands

Tomkins-Johnson Co. is constructing a plant and office facilities on a 13-acre site adjacent to Jackson, Mich. The company makes air and hydraulic cylinders and control valves, milling cutters and reamer tools, and riveting and clinching machines.

Schmitt Improves Plant

Schmitt Steel Inc., Portland, Oreg., has undertaken a $200,000 renovation and modernization program, involving the machine and steel fabrication shops and substitution of electric induction heating for forge furnaces. Officers are: Chairman, W. C. Schmitt; president, Sam Lee; vice president, Gordon Dobbin; secretary-treasurer, A. J. Cook.

Enlarges Filter Plant

Bendix Filter Div., Bendix Aviation Corp., Madison Heights, Mich., is expanding its main plant to provide a 14 per cent increase in floor space for making filters. Additional production, laboratory, and quality control equipment will be installed.

Opens Copper Refinery

Reading Tube Corp. is operating its new copper refinery at Reading, Pa. Cost: More than $4 million. Capacity: About 1200 tons of billets a month. The company makes copper and brass tubing from 1/8 in. to 3 in. in diameter.

REPRESENTATIVES

Misamore-Davis Co. has been organized to specialize in the engineering and sale of original equipment manufacturers' products in the fields of diecastings, fasteners, plastics, molded rubber, screws, springs, stampings, screw machine parts, and wire forms. Principals of the firm are Earl W. Misamore and Gerald B. Davis with headquarters at 20950 Center Ridge Rd., Cleveland 16, Ohio.

ASSOCIATIONS

Alloy Casting Institute, Mineola, N. Y., elected these officers: President, Paul L. McCulloch Jr., Electro-Alloys Div., American Brake Shoe Co., Elyria, Ohio; vice president, J. B. Dear, Duraloy Co., Scottdale, Pa.; executive vice president and treasurer, E. A. Schoefer.

NEW OFFICES

Inland Steel Container Co., a division of Inland Steel Co., Chicago, opened a sales office in the Texas National Bank Bldg., Houston, Tex. James F. Loyd is in charge.

Arthur G. McKee & Co., Cleveland, opened a sales office in the Houston Club Bldg., Houston, Tex. Robert D. Troutman is in charge.

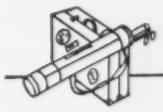
Louis Allis Co., Milwaukee, opened a district office and warehouse at 4405 E. Olympic Blvd., Los Angeles. Grover Brown will manage the unified district function.

Union Metal Mfg. Co., Canton, Ohio, opened a district sales office at 3025 S.W. 58th St., Portland 1, Oreg., with G. W. Kolling as manager.

Highway Equipment Co., Pittsburgh, opened a sales, service, and parts branch headquarters at 40 Hoover Ave., Du Bois, Pa. J. F. Docherty Jr. will be general manager.

Bigelow-Liptak Corp., Detroit, set up a sales office at 20 E. Fifth St., Tulsa 3, Okla., headed by John A. Knebel. The company designs and erects heat enclosures.

Air Preheater Corp., New York, opened a sales and service office at 1371 Peachtree St., Altanta, Ga. B. S. Kelley is manager. The firm manufactures heat exchange equipment.



VACATIONS

Devlieg Microbore Div., Devlieg Machine Co., Royal Oak, Mich., will close from July 21 to Aug. 4. Provision will be made to handle emergency shipments during that period.

CONSOLIDATIONS

Eaton Mfg. Co., Cleveland, plans to acquire **Fuller Mfg. Co.**, Kalamazoo, Mich., whose principal product line consists of transmissions for automotive products. The proposal must be approved by stockholders.

Bart Mfg. Corp., Newark, N. J., acquired **F. C. Kent Corp.** and is moving the operation to a new plant in Newark. The move will take place during the annual two weeks' vacation period, beginning July 18. Kent does tube bending and forming. Bart is engaged in precision electroplating and custom electroforming and is a leading manufacturer of centrifugal pumps for corrosive services.

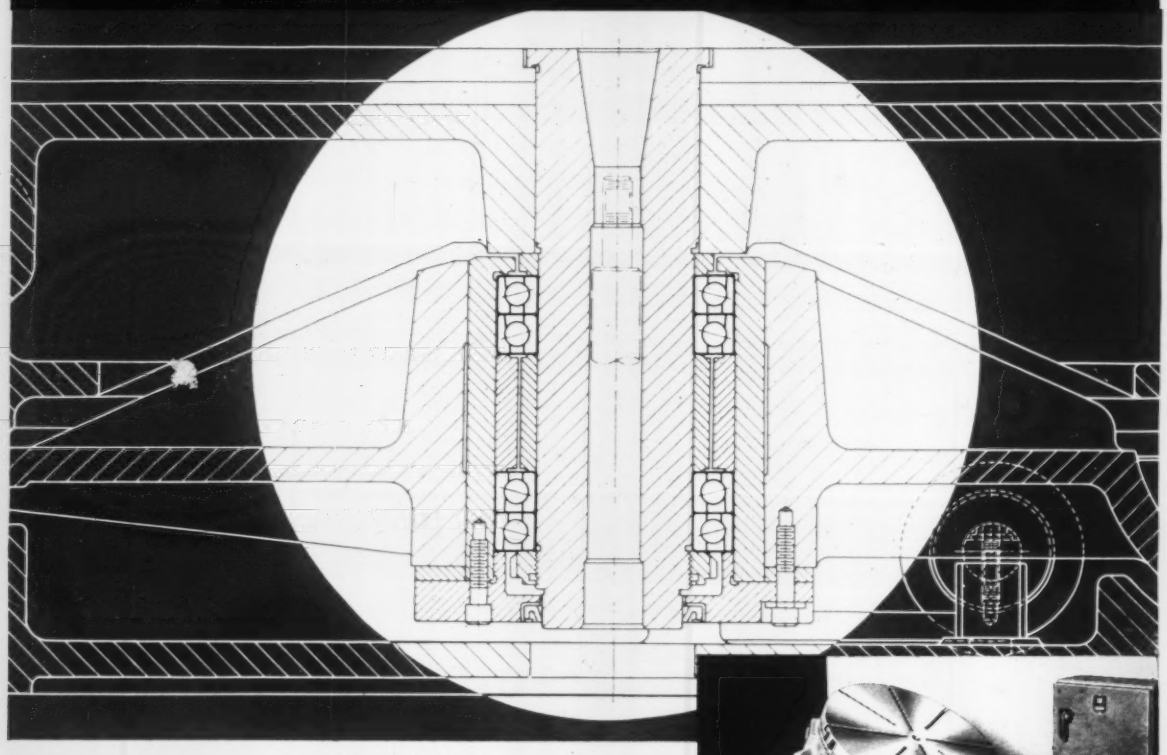
Chemetron Corp. is acquiring **Allbright-Nell Co. Inc.**, manufacturer of meat packing machinery and equipment. Headquarters of both firms are in Chicago. Allbright-Nell will be operated as a subsidiary of Chemetron and will co-ordinate its production and sales activities with the firm's Girdler Process Equipment Div., Louisville.

Heil Co., Milwaukee, purchased **Robertson Mfg. Co.**, Modesto, Calif., which will manufacture part of the Heil line of stainless steel truck tanks.

Textron Inc., Providence, R. I., will purchase **Waterbury Farrel Foundry & Machine Co.**, Waterbury, Conn., subject to approval by the latter's stockholders.

Controls Co. of America, Schiller Park, Ill., acquired **Redmond Co. Inc.**, Owosso, Mich., and **Redmond Motors Ltd.**, St. Thomas, Ont. The Redmond companies make electric motors and rotating equipment.

1½-ton rotary table held accurate to seconds of arc!



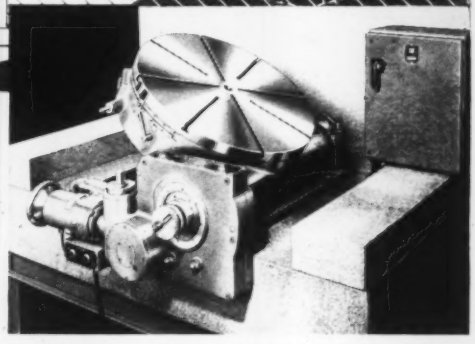
PRATT & WHITNEY
equips for precision with
FAFNIR BALL BEARINGS

The extreme accuracy designed into Pratt & Whitney's 36" Tilting Rotary Table puts a heavy premium on bearing performance. For the critical central pivot application, Fafnir super-precision ball bearings are specified.

Here are bearings with the capacity and rigidity to hold a ton-and-a-half table at *seconds of arc* accuracy — and maintain this precision under large-job work loads.

It takes plenty of bearing to deliver performance like that! Yet the application is typical of many in Fafnir's files. Fafnir's "experience in precision" can help *you* solve a bearing problem. Write The Fafnir Bearing Company, New Britain, Connecticut.

FAFNIR
BALL BEARINGS
MOST COMPLETE LINE IN AMERICA



Pratt & Whitney 36" Precision Tilting Rotary Table is designed for large jobs requiring precise circular spacing and angular positioning. It is completely powered . . . makes possible several machining or inspection operations with a single setup . . . permits direct rotary vernier readings to two seconds of arc over a 360° range and tilting vernier readings to one minute of arc over a 90° range, with a sine bar arrangement for setting table tilt accurately to seconds.

Fafnir Super-Precision Ball Bearings, counterbore construction, support the central pivot of the table component in Pratt & Whitney's 36" Tilting Rotary Table. Mounted in tandem duplex pairs, they provide the exceptional rigidity necessary for this precision application.

STEEL

July 7, 1958

Technical Outlook

NEW MATERIALS—Titanium is ready to take on more jobs. Coming onto the market are three titanium base alloys that can be readily formed in the solution treated or "soft" condition, then strengthened by simple thermal aging treatments. Strengths obtainable are higher than those previously possible in titanium sheet materials, says their maker, Crucible Steel Co. of America, Pittsburgh. One has a minimum yield strength of 220,000 psi.

EVER SMALLER—One of the latest microswitches weighs only 1/28 ounce, and is 0.5 by 0.35 by 0.2 in. Capacity is 250 volts (ac) at 5 amperes. Micro Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill., says the device is only half the size of its regular subminiature model.

STRONG CABLEWAYS—A 4-in. cable for the construction of Glen Canyon Dam in Arizona has a breaking strength of 880 tons. It has a core of regular round wire, concentric layers of key wires, and an outside layer of Z-shaped, locked wire to give a smooth finish. The cable was fabricated by American Steel & Wire, Cleveland.

HI-TEMP LUBRICANT— A new film for coating ball bearings lets them operate for several hours at 500° F with little or no lubrication. Developed by the New Departure Div., General Motors Corp., Bristol, Conn., a single shot of lubricant may replace pumps in missiles and keep the bearings going for the life of the device. The coating also lengthens ball bearing life for high temperature, speed, and load bearing applications.

T-SHAPED INGOTS—Designed to fit fork lift trucks, they save up to 50 per cent in handling time, reports Aluminum Co. of Canada Ltd., Montreal Que.

TEMPERATURE CONTROLS ARC—In an experimental 1000-lb electric arc furnace at the British Iron & Steel Research Association, power input is being controlled by the temperature of the roof or inner walls. Wall temperatures are generally higher than those of the roof but are less stable because they respond rapidly to short time changes in the bath and arc. It indicates that roof temperature power control is the better method.

LIGHTWEIGHT STRUCTURAL SHAPES—Large aluminum extrusions, available in heat-treated lengths up to 80 ft long, are the equivalent of wide flange steel beams up to 33 in. wide, says Harvey Aluminum, Torrance, Calif. They weigh 80 lb per foot, compared with 240 lb for a comparable steel shape.

FLEXIBLE CERAMIC— Ceramicite - coated wire retains insulation resistance at 1000° F and the wire is completely flexible, says the Ceramic Products Dept. of Consolidated Electrodynamics' Transducer Div., Pasadena, Calif. The ceramic makes an especially tight bond on stainless and heat-resistant alloys.

LP-GAS CONTAINER—Cylinders made from aluminum will simplify handling. A 100-lb capacity unit made by Benson Mfg. Co., Kansas City, Mo., weighs one-third less than most bottles used for gas. It will withstand 900 psi.

HOW TO DRESS WHEELS—Here's a clue to faster stock removal with grinding wheels. Use a star dresser and crown the wheel face about 1/16 in. It reduces the area of wheel-to-work contact and gives a coarse dressing, states Norton Co., Worcester, Mass.

SPEEDY VACUUM FURNACE—C. I. Hayes Inc. has a new design that heats a load to 3000° F in 30 minutes and cools it comparatively fast. Significance: Fast cycling feature makes many more jobs cheaper to heat treat in a vacuum. The process eliminates pickling and final finishing. Its secret, says the Cranston, R. I., firm, is a molybdenum heating element shaped like a three-legged stool (the seat is a ring instead of a disc). The device gets by on 8 volts to avoid ionization.

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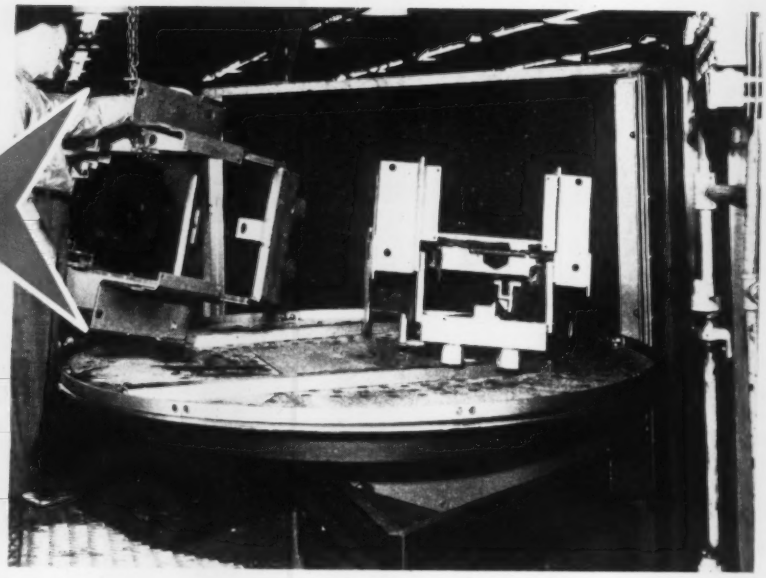


The 108-in. Wheelabrator swing table cleans one part in 35 minutes. It used to take 1 hour 15 minutes of hand cleaning. The time on another part has been cut from 37 to 12 minutes. A conveyor (see photo at left) serves as storage and also delivers parts to the machine. Another conveyor hauls finished parts to the paint booth. Blasted finish also helped in painting

How We Beat the Cost Crisis

Abrasive Cleaning Saves Us

This company has paid for its weldment cleaning equipment in less than a year. It's an example of how aggressive management is working to curb inefficiency and crop unnecessary expenses through production improvements. This article is one of the top entries in the Cost Crisis Awards Competition. Look for another next week

WELDMENTS used to be hand ground, brushed, and chipped to remove flux, scale, and discolorations at Towmotor Corp., Cleveland. The process was thorough but time consuming and often tedious.

Production and methods management began looking for a better way to do the job. While visiting another company, one of the Towmotor men saw weldments being cleaned by abrasive blasting. He talked with the equipment builder, Wheelabrator Corp., Mishawaka, Ind. After the details had been worked out, he made a proposal which sold itself to his management.

Now—The special 108-in. swing table machine is installed next to the plant wall, near the welding department. Weldments are set on a conveyor which doubles as a storage unit. The machine operator starts and stops the conveyor, bringing weldments up to the machine when they're needed.

Weldments are lifted from the conveyor and moved to the machine table on an overhead hoist. The table, mounted on the machine door, swings into position adjacent to the conveyor for easy workpiece loading.

After the cleaning cycle is completed, the machine door (and table) swing out, and the parts are put on another conveyor that takes them to the painting department.

Savings—Production is done at a saving of 200 manhours a week,

EXAMPLE:

Small Truck Frames

OLD METHOD:

Grind, size, and clean
Hours per part 1.250

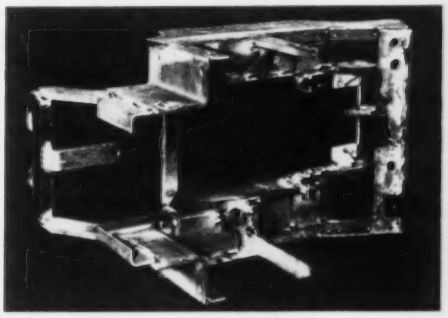
NEW METHOD:

Grind and size, then abrasive blast clean
Hours per part 0.590

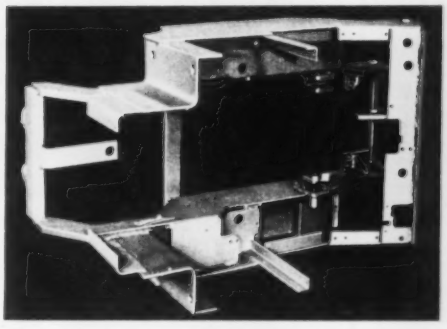
Grind and size . . . 0.274 hr
Clean . . . . . 0.316 hr

HOURS SAVED 0.660

DOLLARS SAVED . . . . . $3.88 per part



BEFORE: Frame has scale, poor finish



AFTER: Clean, matte finish aids painting

$40,000 a Year

permitting the reduction of one shift and the transfer of five men to other jobs.

Towmotor's standards department keeps a close rein on all costs. Machine operators fill out a work record sheet, reporting every job and every part processed.

Based on the reports, here are savings on four of the more than 12 weldments cleaned. (A fifth has already been cited.)

Small Series Masts: They used to take 22 minutes to clean, vs. 10 minutes now. Saved: $1.18 a part.

Large Series Masts: They used to take 37 minutes each, vs. 12 now. Saved: $2.43 a part.

Small Series Carriages: They used to take 20 minutes, vs. 6 now. Saved: $1.28 each.

Large Series Carriages: They used to take 18 minutes, vs. about 6 now. Saved: $0.98 on each part.

Total savings come to over $40,000 a year—that's more than the installed cost of the machine.

Benefits—Other gains don't show up in the cost columns. For example, N. K. Brothers, factory manager, reports the matte finish, produced by abrasive blasting, is easier to paint because the first coat adheres better than it did on the ground and chipped part.

The better, more uniform, surface finish also makes it easier for inspectors to detect substandard welds. Rejects are immediately taken out of the production process, preventing further expenditure of time and money on bad parts.

Other Payoffs — The cleaning change is one of a series of production steps taken to cut the unit costs of Towmotor's industrial fork lift trucks and tractors.

In several cases, relatively small expenditures for new capital equipment permitted the company to produce parts that used to be subcontracted. Here are three recent examples:

1. Four lines of truck frames are welded on new equipment in the Towmotor plant; savings come to well over $300,000 a year.

2. Head guards, the structure over the truck operator that prevents his injury when loads slip, are now bent and welded in the plant for some $25,000 less a year then they used to cost.

3. With only a little additional capital equipment, Towmotor now makes its own hydraulic tilt jacks —at a saving of some $40,000 a year.

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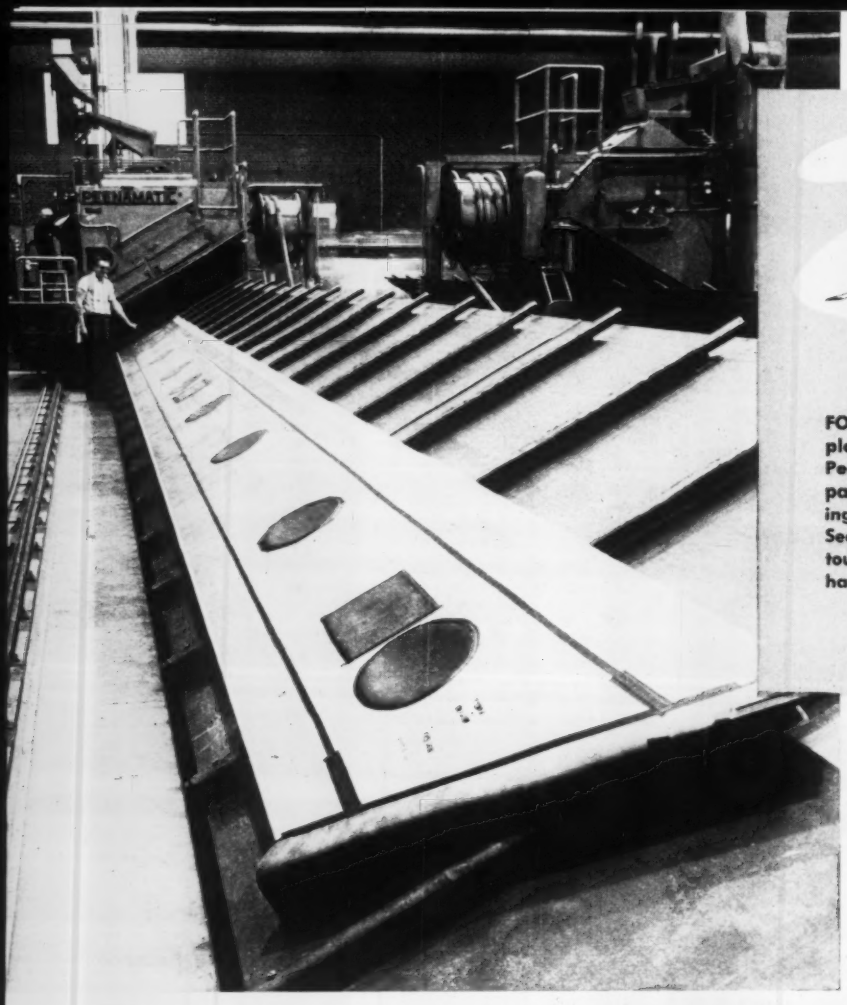
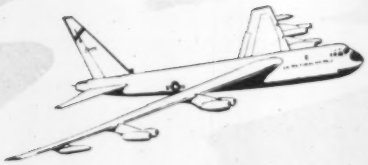




FORMING A WING FOR B-52 at Boeing Airplane Co., Wichita, Kans. The carriage of the Peenamatic machine moves along the wing panel, battering it with steel shot. The drawing at right shows how contour is formed. Sections of panel which do not require a contour are masked with rubberized tape. Boeing has contoured small wing panels in 30 minutes

Steel Shot

Aircraft firms are forming the airfoil on large, ribbed wing panels by peening. It's the fastest and simplest way to do it. Added benefit: Better fatigue strength

SHOT PEENING is widely used in metalworking plants to improve the fatigue life of parts. A few companies have taken the process a step farther: They are using it to contour large sections.

Boeing Airplane Co., Wichita, Kans., forms wing skin panels for the B-52 by peenforming. The integrally stiffened panels can't be run through bending rolls; the aluminum alloy (7075S-T6) is too hard for ordinary cold forming methods; and the size of the panels makes hot forming impractical.

Lockheed Aircraft Corp., Burbank, Calif., was one of the first plants to use the method. The company brought peenforming into its plant when integrally stiffened wing panels were adopted for the Constellation in the place of multiple piece skin and stiffener structures.

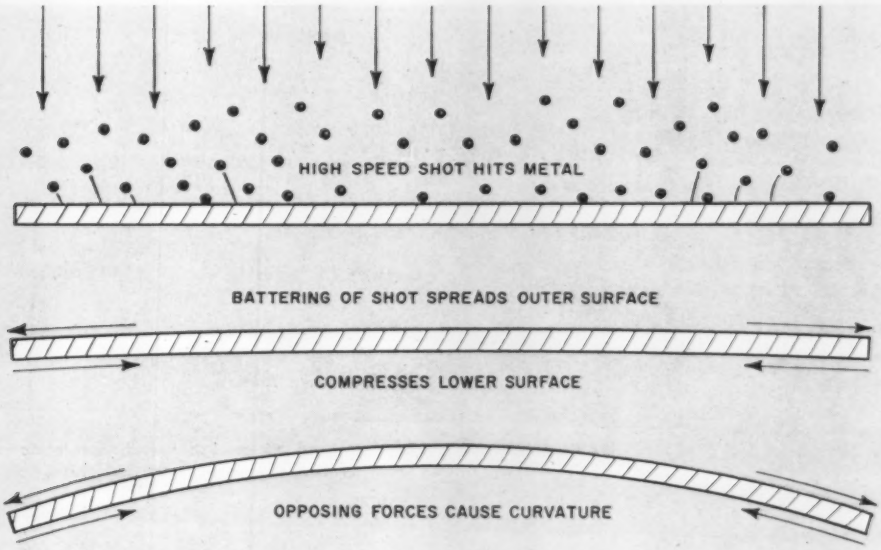
Vickers-Armstrongs (Aircraft) Ltd., England, peenforms airfoil surfaces for the Vanguard airliner.

Contours and Strengthens—Peenforming is done by driving steel shot against the surface to be contoured. The force of the shot spreads the top surface of the metal and causes the lower surface to contract. This results in a contour.

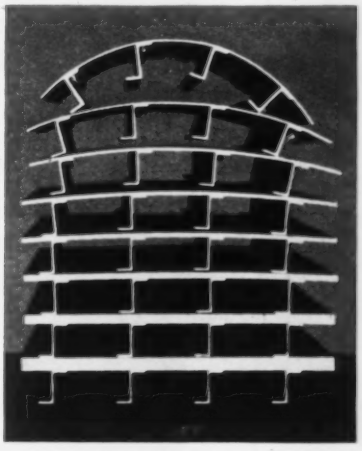
Peening has a packing effect on the metal and tends to strengthen the panels. At Boeing, the method has proved faster, simpler, and better in contouring airplane panels than bending rolls, die forming, or furnace treatment. Small wing panels have been peened in 30 minutes.

Machines Have Evolved—Early machines consisted of a shot peening cabinet (it housed the nozzles) and two long conveyors on either side. To contour a wing panel, it was moved slowly through the cabinet from one conveyor to the other. As the panel passed through the enclosure, it was pelted with fine shot from the nozzles.

The new traveling carriage machines mark a real advance. Called Peenamatics (made by Metal Improvement Co., Los Angeles), they require less floor space than fixed machines. Work handling and contour inspection are simplified and speeded because one end of the sta-


HIGH SPEED SHOT HITS METAL
BATTERING OF SHOT SPREADS OUTER SURFACE
COMPRESSES LOWER SURFACE
OPPOSING FORCES CAUSE CURVATURE

Blasts Panel Contour



Test panels peenformed at Metal Improvement Co. to show curvature that is possible. The top panel is 0.125 in. thick and has been formed to an 11.5 in. radius. Lower panel has 1570 in. radius, is 1 in. thick

tionary panel can be inspected while the carriage is peening at the other end.

Shot Force Adjustable—The steel shot is air driven from a rack of ten nozzles mounted on the moving carriage. The force and amount of the shot can be varied to form a wide range of skin thicknesses. (The Boeing B-52 wing skin panel tapers from 5/8 to 3/32 in.) The rack moves in a reciprocating motion across the work, while the carriage progresses lengthwise along the table.

Nozzles are offset laterally so the path of each is different. The spacing of the nozzles and their distance from the work are adjustable. The speed of the carriage gantry can be varied to form a marked or slight contour. Sections which do not require a contour can be masked off with paths or strips of rubberized tape.

Work Rests on Rolls—The machines can handle work up to 6 x 76 ft. The worktable (it's 96 ft long) is tilted at about a 35-degree angle so that shot falls out of the way after it hits. The workpiece rests on rubber rollers across the table which are supported at the lower edge by steel clips.

The operator on the gantry can watch the nozzles through the window in the enclosure. The sides of the enclosure are formed by rubber fringe which restrains flying shot but flexes over the surface of the work. A second operator checks the contours with templates.

After striking the panel, shot from the nozzle falls into a trough at the lower edge of the table. A conveyor belt returns it to the bin on the gantry for re-use. Gradually, used shot is replaced with new material.

Large Shot Preferred—Maximum pressure behind the shot is about 60 psi; the machines normally operate at about 25 psi. Both Boeing and Lockheed use large diameters. Boeing uses 0.093 in. diameter steel shot; Lockheed uses 0.174 in. The larger size (diameters down to 0.028

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have been used) leaves less dimple depth for a given change in curvature.

The compressive surface stresses set up by peenforming are biaxial—they tend to create a lengthwise contour in the panels as well as across it. It is necessary to have lengthwise stiffeners or ribs when peenforming for chordwise curvature. When long, thick, ribless panels cannot be peenformed to an airfoil contour without creating excessive lengthwise curvature, it has been necessary to go to local press forming at room temperature, followed by shot peening to replace residual tensile stresses with compressive ones.

Fills Need—Peenforming provides a practical method for forming the large, integrally stiffened panels produced on extrusion presses and skin mills. The method requires no dies and is compatible with the variations in curvature that occur in parts after final machining.

The compressive residual stresses imparted to both surfaces are beneficial. Forming processes which allow springback induce residual tensile stresses on the concave side. Peenformed structural parts have a much lower susceptibility to stress and corrosion fatigue.

Studs Hold Stainless

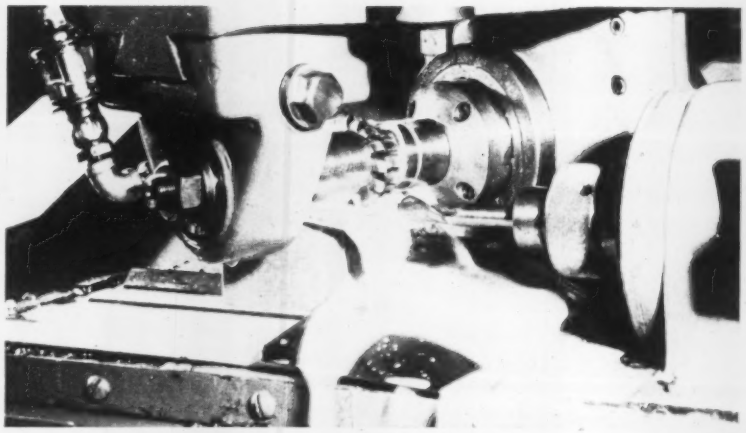
Welding studs secure stiffeners for thin gage material. Method does not mar the surface

STUDWELDING stainless without burning the opposite surface is done at Viking Equipment Co., East Orange, N. J. The method eliminates the need for grinding and polishing after the welding.

Viking uses the 6000 D welder made by Graham Mfg. Corp., Needham Heights, Mass., in the production of kitchen and restaurant equipment.

Studs are used to hold stiffeners to large pieces of stainless, preventing bow in thinner gage sheets. By using oversized holes, the stiffeners are used as templates. Studs are fired through the holes, and nuts are applied immediately, increasing the speed of fabrication.

The welder is a self-contained portable which operates from 110 volts. It draws 10 amperes.



Water soluble coolant being used on a high speed, automatic milling machine developed by Illinois Tool Works for milling end mill flutes

Coolant Stops Rancidity

The condition was interrupting heavy production schedules because of frequent machine cleanout. By careful tests, the firm came up with the right coolant, and cut costs

EXPLORE the hidden maintenance costs in your operation. They may provide the means of meeting the demand for greater economy.

Illinois Tool Works reduced costs and increased efficiency at its main plant in Chicago by switching to Vantrol 545 water coolant to solve a problem in rancidity.

The company was having sporadic trouble with a water soluble coolant. Rancidity would show up in machines that had heavy production schedules, and correction of the condition required machine cleanouts that interfered with production. Increasing the frequency of machine cleanout would have cleared up the problem but would also have increased maintenance cost and the coolant bill.

Established Evaluation Program—A group headed by Ed Leighton, chief industrial engineer, and John Tapper, works manager, began a series of tests and analyses. They arranged a thorough cleanout and maintenance schedule so housekeeping was maintained at the best possible level. But coolant still spoiled occasionally.

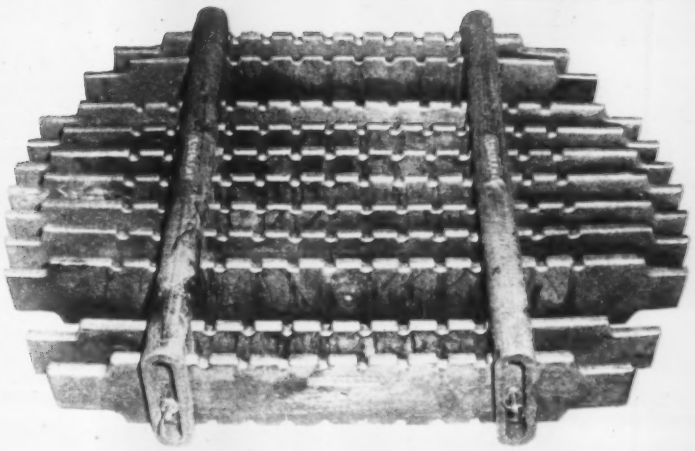
Coolant evaluation tests were started. The group established a standard of tool life and machine maintenance, then began the search for a long-life coolant that would meet machining requirements.

By carefully checking different coolants against tool life, machine maintenance, and coolant life, they found that Vantrol 545, made by Van Straaten Chemical Co., Chicago, met their requirements. It was effective in carrying grinding swarf to the bottom of the tank, preventing it from accumulating on the machine or in the coolant lines.

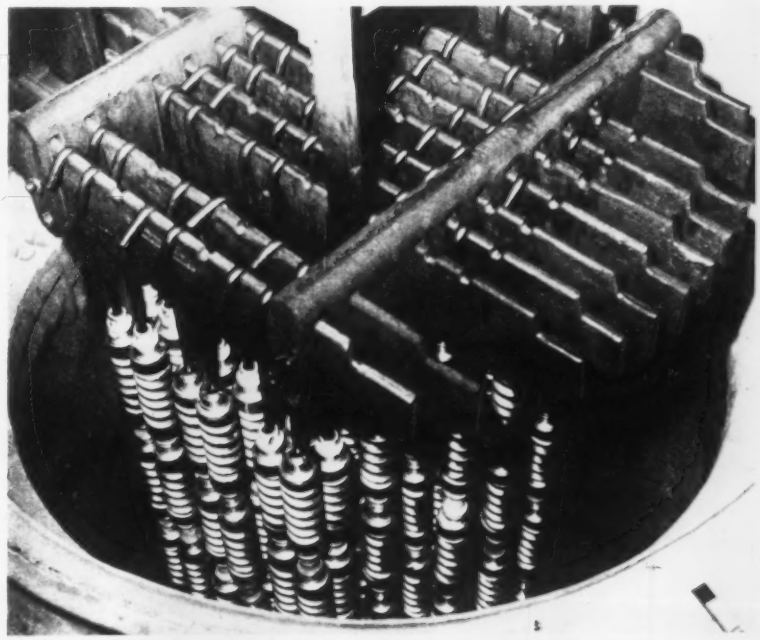
Maintenance Costs Cut—The life of the coolant made it possible for Illinois Tool to reduce the frequency of machine cleanout and cut cost of both maintenance and coolant. The compound had a six-week coolant life where previously the schedule had to be set at two weeks. The company established a four-week cleanout schedule to remove accumulated swarf.

An additional advantage: Illinois Tool now has a coolant that can be used as both a grinding and cutting compound wherever the machining operation calls for a water soluble compound.

Alloy Extends Fixture Life



Cast leaves of this heat treating fixture are pinned to form a jointed grid



A load of cams is lowered into the carburizing furnace

Maintenance downtime is reduced by making heat treating fixtures from a high alloy casting that can withstand repeated thermal shocks. The units are used for carburizing

ENGINEERS at Ross Gear & Tool Co., Lafayette, Ind., were faced with two problems: How to heat treat large numbers of automotive steering assembly parts in a single cycle, and how to get longer life from the heat treating fixture.

A high alloy cast fixture of articulated design solved both problems. The fixture is used to carburize 300,000 to 400,000 lb of steering assembly parts each month. Long life is important to assure steady and efficient production with minimum maintenance downtime.

Alloy Meets Requirements—Fixtures must repeatedly resist long exposure to high temperatures and the thermal shock of quenching, in addition to providing a solid support for the heavy load.

Type HT cast alloy (35 per cent Ni, 15 per cent Cr, 0.50 per cent C, balance Fe and small amounts of Si and Mn) is used in fabricating the fixtures. It has excellent resistance to carburizing atmospheres, the ability to undergo thermal shock without severe distortion, high strength, and excellent hot gas corrosion resistance. At 1700° F, it has double the strength of the comparable wrought alloy, says the Alloy Casting Institute.

The fixture is designed as a group of individual leaves, forming a flexible grid that is loosely pinned together through box members. The leaves support the load without

braces. Thermally imposed stresses would distort braces.

The slotted hollow box members (Type HT alloy) keep the leaves positioned laterally while giving them freedom to expand longitudinally. The castings act as girders when the load is transferred to the quench tank.

Other Uses—The furnaces support ring, radiant tubes, fan, and pedestals are made of Type HT alloy castings. Moderately increased carbon content does not significantly affect the metal's high temperature ductility.

The pit-type furnaces are heated by gas-fired radiant tubes. Since muffles are not needed, the maximum charge per load is attained.

Typical Cycle—A representative treatment is that given the worm-type cam. It is made from SAE 8260 bar stock. About 2½ hours are required to bring the furnace and load up to heat. The cams are held at 1700° F for 8½ hours, then lowered to 1575° F for 1 hour to equalize the work temperature.

During the cycle, 265 cu ft of carburizing atmosphere (including 15 cu ft of natural gas) are used per hour. After heating and holding, the work and fixture are quenched in oil.

The operation is designed to obtain a Rockwell hardness of C58-63 and a minimum case depth of 0.045 to 0.075 in.

New Alloy for Hot Service

A new consumable arc, vacuum melted alloy, W-545, for high strength applications up to 1350° F is being offered by Westinghouse Electric Corp.

The company says it can be easily fabricated into highly stressed parts such as turbine wheels, couplings, shafts, valve stems, and bolts in missiles.

The Wrong Twist

The June 23 issue of STEEL (p. 89) gave Armco Steel Corp., Middletown, Ohio, as the source of a report on an ingot mold coating, Albi MRX. The report should have been attributed to the maker, Albi Mfg. Co., Rockville, Conn.

Inserts are installed with a hand tool. The insert is located about ½ turn below the top of the threaded hole. The driving tang is broken off after installation

Strong Threads for Aluminum

Stainless steel inserts form a solid thread surface in castings. They are being used in pneumatic impact wrenches and aircraft compressors for vibration resistance

SELF-LOCKING stainless steel inserts put threads in aluminum parts that eliminate wear and reduce assembly costs. They're produced by Heli-Coil Corp., a division of Topp Industries, Danbury, Conn.

For example, Chicago Pneumatic, Utica, N. Y., uses wire thread inserts with four bolts that join a cast aluminum motor housing and aluminum clutch housing of its reversible air impact wrench (CP-610). The threads are protected against wear caused by frequent disassembly and vibration damage. They are made from 18-8 stainless steel wire with a tensile of about 200,000 psi.

How Inserts Work—The flange bolts are held securely by one or more grip coils near the center of the insert. The locking coils approximate a polygon instead of being circular.

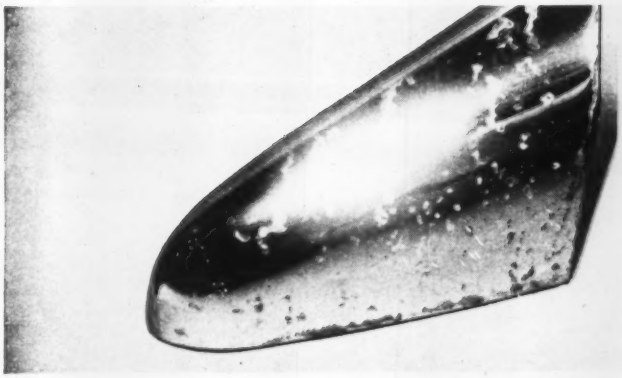
As the bolt is run through, the chords of the grip coils are forced outward to conform to the tapped hole, maintaining a strong, spring-like pressure on the bolt. The locking effect is not diminished by repeated disassembly.

Installation Is Simple—The cast aluminum housing is positioned in a drill jig, and holes are drilled with a 0.261 tap drill. Slightly oversized threads (to accommodate the inserts) are tapped with a ¼-28 Heli-Coil tap.

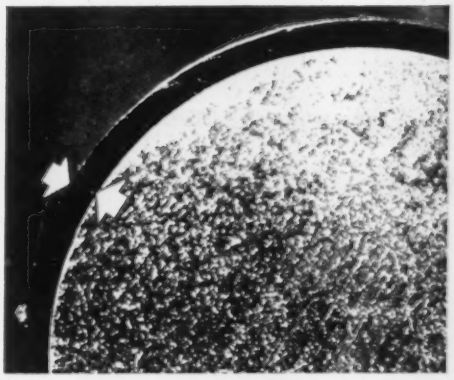
A bench mounted, power driven inserting tool prewinds and installs the ¼-28 Heli-Coil self-locking insert. The driving mandrel is automatically disengaged when it has been driven to the preset depth. The driving tang on the end of the insert is removed with a sharp blow to allow full entry of the mating bolt.

Example — Another application was found by engineers at Carrier Corp., Syracuse, N. Y. They use high strength aluminum alloys in designing a compact, lightweight compressor for the refrigeration system of the Douglas DC-8 jet airliner.

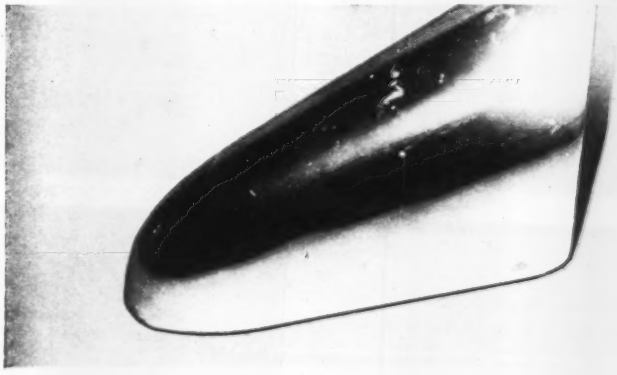
Vibration resistant threaded connections were made possible by the wire thread units. They are used in the majority of threaded connections in the compressors.

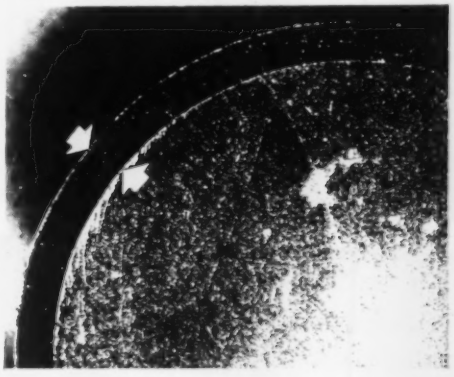


UNICHROME BRIGHT CRACK-FREE CHROMIUM MADE THIS DIFFERENCE IN PROTECTION. Photographs show results of 72 hour acetic acid salt spray test. Part at top was plated with ordinary chromium according to automotive manufacturer's specifications for copper, nickel, chromium finishing. Part at bottom had same copper and nickel deposits but Unichrome Crack-Free Chromium replaced the ordinary chromium, thus greatly increasing corrosion resistance.



UNICHROME SRHS® CHROMIUM MADE THIS DIFFERENCE IN THICKNESS. Enlarged cross sections of identical steel rods show ratio of thickness of plate from ordinary chromium solution (top) to thickness from SRHS Chromium Solution (bottom) . . . a much thicker deposit in the same plating time!





How to get more corrosion resistance from chromium plate

When consumers find fault with decorative chromium plate, it's generally due to early corrosion.

This trouble starts with pores and cracks that occur in all ordinary chromium in the range of thicknesses generally used for decorative plating. Road chemicals, salt atmosphere and fumes find a path right down to base metal. Corrosion starts. As corrosion increases, finish failure progresses, allowing still more corrosion.

But you can stop this at the source.

THICKER, CRACK-FREE CHROMIUM

Chromium itself is passive. It doesn't corrode. Eliminate pores and overcome its cracking and you greatly improve its corrosion *protection*. Pores are eliminated by thicker plating. To overcome cracking, use the Unichrome Bright *Crack-Free* Chromium Process. This deposit is free from corrosion-admitting cracks. It has already been used in automotive production for a year.

MINIMIZE YOUR PRODUCTION PROBLEMS

Unichrome *Crack-Free* Chromium is far superior to ordinary chromium not only in protection, but also in operating advantages. The solution is self-regulating. It offers improved throwing power, also better coverage — even over passive nickel.

TO PLATE THICKER CHROMIUM

For those who desire thicker deposits but do not require freedom from cracking, other Unichrome self-regulating processes offer distinct advantages. They plate up to 80% faster than ordinary chromium plating processes. They cover parts with less dulling or burning, are less susceptible to clouding due to current interruption. Control is simplified by their self-regulating features.

Whichever process is best for your operations, Metal & Thermit has over 30 years of service experience to help you make it work. Call in an M&T plating engineer to survey your requirements, tell you what's needed for the results you want. Or, send for Bulletins.

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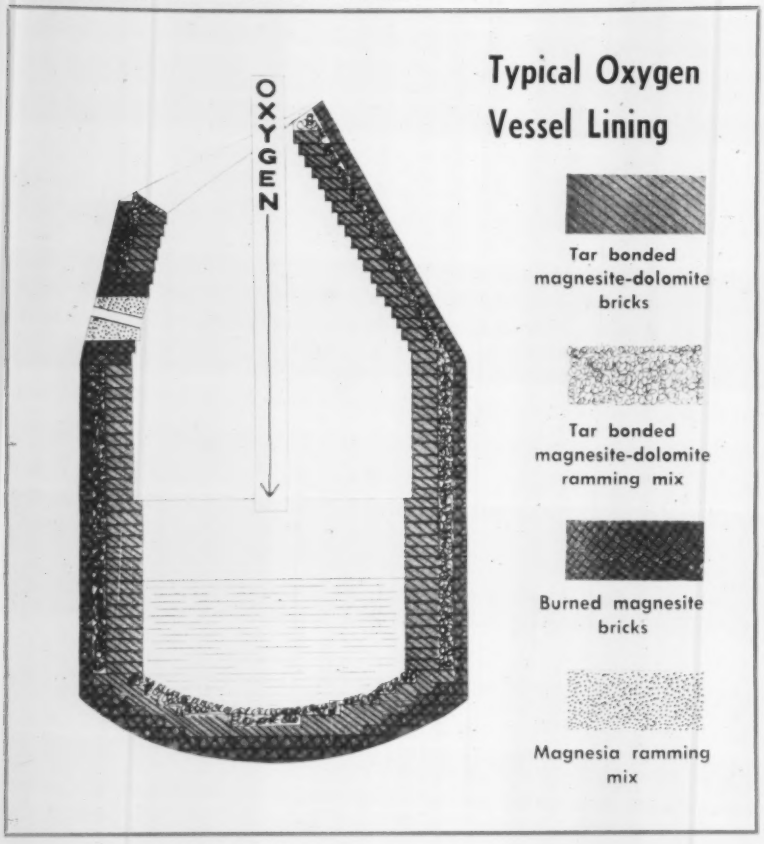


Tar Bonds Oxygen Vessel Bricks

Basic refractories with this type binder are being introduced in the U. S. Ideally suited for the oxygen converter process, they may have other uses as well

By J. P. HOLT
Executive Assistant to the Vice President of Sales
Basic Inc.
Cleveland, Ohio

BASIC REFRACTORIES bonded with tar have been common in Europe for years. Their use in this country has been limited. One reason is that fired and chemically bonded magnesite refractories are readily available. Generally speaking they are also much easier to use.

However, we have recently embarked on a new method of producing basic steel—the oxygen converter. It employs basic slags and, consequently, the vessel must be lined with basic refractories. Tar-bonded basic refractories are particularly suitable for this method.

Three Kinds Available — Tar-bonded refractories for lining vessels are of three types: 1. Magnesia. 2. Dolomitic. 3. Dolo-magnesia.

The dolomitic and dolo-magnesia types, which contain dead-burned dolomite, have certain advantages over the straight magnesia type. They are relatively inexpensive. They have particularly good spall resistance. They resist the fluxing action of highly basic slags and those containing relatively large amounts of silica.

Some distinct disadvantages are also imparted to such refractories by dead-burned dolomite. A tendency to hydrate causes the dolomite to swell up and powder, breaking down the structure of the refractory which contains it. This is more evident in pressed dolomitic bricks than in granular refractories of similar composition.

Dolomite Not Stabilized—Dead-burned dolomite can be made resistant to hydration (stabilized) by silica additions. This is usually done at the time the dolomite is dead-burned. However, oxygen steelmaking vessels (and electric furnaces) operate within temperature ranges at which large amounts of liquid form in such refractories, making them unsatisfactory. This is why domestic tar-bonded basic refractories contain dead-burned dolomite instead of the stabilized variety produced in Europe.

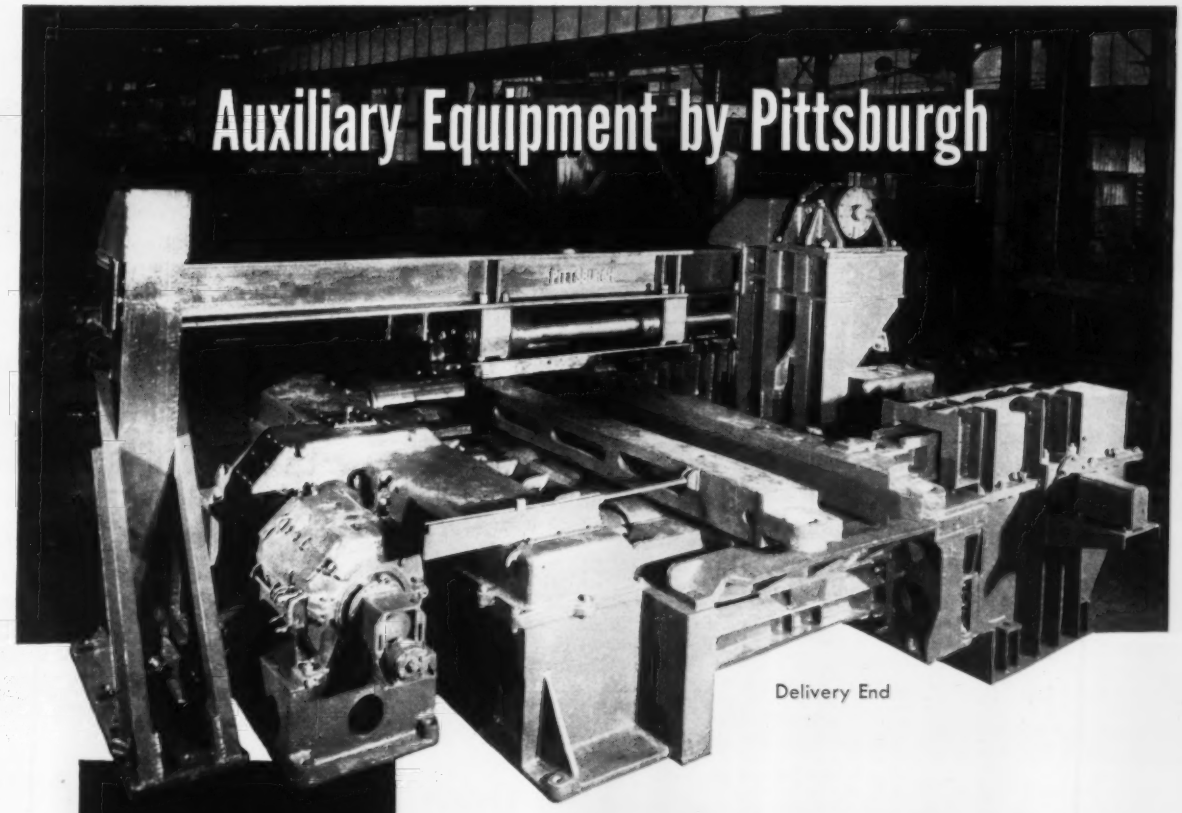
In making tar-bonded refractories, a fine fraction is ground and blended with a coarse fraction. The blend is heated above the melting point of the tar and then mixed with it. The bricks are pressed while the mix is still hot.

Grain Size Important—The magnesia constituent of tar-bonded refractories has a composition typical of the dead-burned grain magnesite which might be used to make magnesite bricks. To achieve adequate densities (around 180 lb per cu ft), bricks must be made from carefully proportioned mixtures of coarse and fine particles. Ground magnesia is commonly used for the fine fractions of tar-bonded basic refractories whose coarse fractions are made from dead-burned dolomite.

Chemically bonded, as well as tar-bonded basic refractories, are often compounded of dead-burned dolomite as the coarse fraction and ground magnesia as the fine fraction. (Finely ground dolomite hydrates too quickly.)

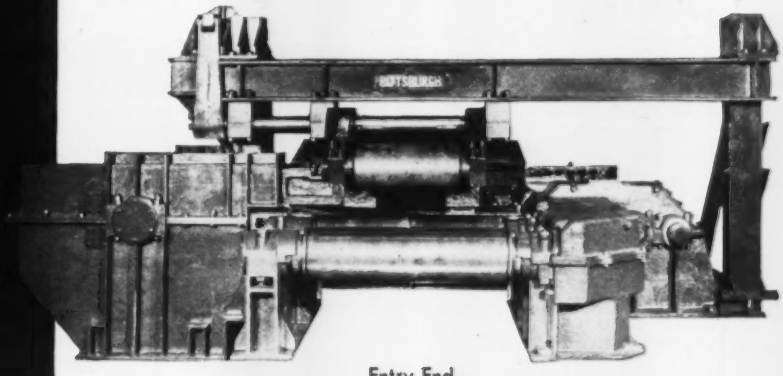
One Canadian steel company

Auxiliary Equipment by Pittsburgh



Delivery End

slab scarfer table with holddown roller and adjustable guides



Entry End

This Slab Scarfer Table is a typical example of the wide variety of auxiliary mill equipment designed and built by Pittsburgh Engineering and Machine.

Slabs from the blooming mill are scarfed on all four sides in an adjacent unit thus eliminating 1/64-1/32" of scale and other surface irregularities.

We can help you with your requirements for primary and auxiliary mill equipment.

"Electric and open hearth steel castings from 1 lb. to 100 tons"

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ALL inquiries receive prompt attention. Illustrated catalogs give helpful working data—show many modern applications—enable you to select the best pattern for any purpose.

DIAMOND MANUFACTURING CO., WYOMING (Wilkes-Barre Area) **PENNA.**

New Bulletin No. 47, describes DIAMONTEX Perforated Metal Lay-in Panels for Modern Acoustical Ceilings.

PRODUCT SPECIALIST
(Pipe and Tubing)

A primary requirement is a thorough knowledge of large diameter, high temperature, high pressure, Chrome-Moly and Stainless Steel commercial tubing. This includes tubing fabrication and, especially, end uses. The applicant selected must know markets, present and potential. He must have the ability to advise, both internally and in the market, on the application of high grade pressure tubing in the Nuclear Power, Chemical, Petrochemical, Food and Public Utility fields where this product is used in mass. A man with the required experience and executive bent will find an excellent opportunity with this modern facility in Western New York State.

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makes tar-bonded bricks entirely of dolomite, but these are installed in the furnace within a short time after they are produced, or are immediately placed in a room in which humidity is kept extremely low.

Tar Must Be Right—The amount of tar used to bind the bricks together may vary, depending upon such things as the composition and porosity of the refractory granules, their size, and the use of the bricks. Various bricks contain from about 4 to 7 per cent tar.

Probably the most important quality of the tar is its coking characteristics. The coal tar pitches have much more favorable coking characteristics than do substances like asphalt.

When coal tar pitch is heated, a large proportion of it decomposes leaving a carbon residue which acts as an intermediate temperature bond for the bricks. This produces a refractory with good spall resistance. The carbon bond is resistant to slag attack, but it will oxidize. On the other hand, when an asphalt binder is heated, most of it volatilizes without decomposing and little or no bond is left.

Must Be Kept Dry—Considerable work has been done toward developing a satisfactory coating or wrapping for bricks containing dead-burned dolomite which will inhibit hydration or prevent it entirely. Wrapping of pallet loads with a moistureproof paper or plastic looks promising.

Tar-bonded dolo-magnesia bricks which are made with coarse grains of dolomite and fine grains of magnesia must be used within a few days after manufacture unless protected from hydration. They may be packaged so that they can be stored two to four weeks, depending on atmospheric conditions, but the packaged bricks must be put into high temperature service immediately once they are unwrapped.

Tar-bonded bricks made of dead-burned dolomite must be used immediately or stored in a "dry" room as soon as they are pressed. They must be used promptly on withdrawal from storage.

Tar-bonded ramming mixes made from magnesia, dolomite and magnesia, or from dead-burned dolomite have hydration characteristics simi-

lar to the bricks of the same composition. However, these bagged ramming mixes resist hydration better than the corresponding bricks.

Here's How They're Used—The illustration on Page 74 is a section through a steelmaking oxygen vessel. It shows burned magnesia bricks used against the shell and in the taphole section. Next comes a layer of tar-bonded ramming mix and finally, on the inside, tar-bonded basic bricks. The insertion of this layer of tar-bonded ramming mix between the two layers of bricks performs several functions:

1. It provides a certain amount of dimensional adaptability to take up changes in dimensions in the vessel itself. Thus, the inside cavity of the vessel will have about the same dimensions after each relining.

2. It helps to tighten the inside lining because it is tamped in place after each course of the inside lining has been laid.

3. It helps the operator to determine when the vessel must be relined because as soon as he notices that the brickwork pattern has disappeared, he knows that the lining has eroded back to the ramming mix layer. The vessel may then be taken off the line before any damage has been done to the tank lining, which remains in place indefinitely.

Baked Before Use—The brick lining must be heated in place to form the coke bond (then kept heated) before the vessel can be used. One difficulty is that these refractories lose their strength at temperatures at which the tar softens.

At room temperature, tar-bonded bricks are strong and tough and may be handled with little likelihood of breakage. Strength decreases as the temperature rises to the point at which the tar softens. At temperatures of about 1500° F. when fired under reducing conditions, the tar decomposes and cokes, forming a carbon bond which increases the compressive strength of the bricks markedly.

As temperatures go higher, under oxidizing conditions, the carbon on the hot face of the bricks starts to burn away, but as we approach the operating temperatures of steelmaking furnaces, ceramic bonds begin to form, and at temperatures

Logan Conveyors speed production in prominent machine tool plant. Gate Sections in foreground provide passageway through assembly line and step plates between rolls allow easy access for operators to work stations. Transfer Car handles incoming sub-assemblies.

Locating ways to cut costs, always a good practice, becomes even more important as competition increases. A "head-to-toe" examination of every element of cost is the order of the day. Many companies are reducing operating expenses through improved materials handling.

Logan Conveyors, with built-in engineering "extras" are being called upon to solve handling problems for economy minded firms of all sizes. Most users report immediate savings in effort, time and space — savings that have materially strengthened their selling position. Certainly there is much to support those who believe that *sales do begin in the shop.*

Write today for more information or for nearest engineer to call.

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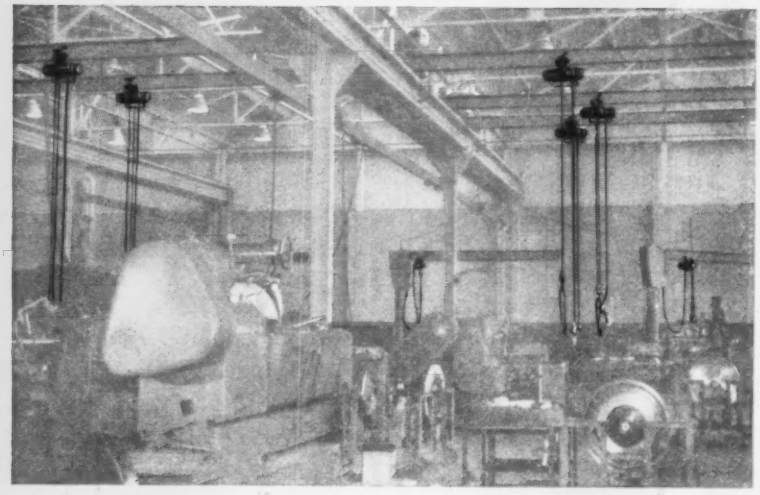
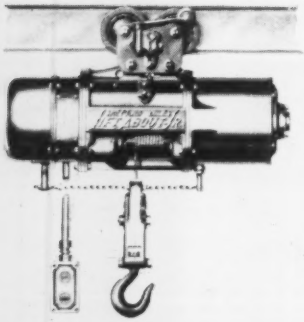
LIFTABOUT JR.

Moves more material and work-in-process

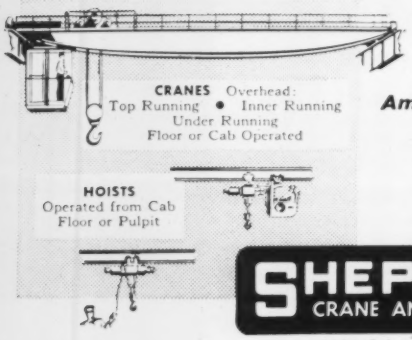
AT LOWER COSTS





ELIMINATE costly manual lifting and lugging . . . speed raw materials, work - in - process and finished products along your production line with a Shepard Niles LiftAbout, Jr. Low in cost, this rugged hoist will give many years of thrifty, dependable service.

Available in 250, 500, 1000 and 2000 lb. capacities . . . parallel or cross-mounted with bolt, hook or trolley suspension. Send for the LiftAbout, Jr. bulletin today . . . or ask to have a Shepard Niles representative call—there's NO OBLIGATION.



Building

America's Most Complete Line

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2398 Schuyler Ave., Montour Falls, N. Y.

approaching 3000° F, the bricks again become strong.

Fast Heatup—To keep the bricks in place during heating up, they must be laid carefully and keyed tightly. The bricks must be made to close dimensional tolerances and should have sharp, clean corners and smooth faces.

The working surface of the lining must be brought up to a coking temperature rapidly before the mass of the lining as a whole reaches softening temperature. Care must be used not to move or jar the vessel while the lining is being heated up.

One procedure is to charge the newly lined vessel with a large amount of incandescent coke and then to turn on the oxygen jet. This burns in the inside layer of the lining rapidly without serious damage to it. In order not to burn out the tar bond, the heating up and burning in of a tar-bonded lining must be done in a reducing atmosphere.

Most Spots Taboo—Tar-bonded refractories containing dead-burned dolomite must not be used where moisture is likely to come in contact with them. For instance, the brickwork around a taphole, which may subsequently be piped with a moistened magnesia ramming mix, must be made of hydration-resistant magnesia briks.

Since small amounts of moisture may collect next to a furnace shell, it is generally preferable to construct tank linings from burned basic bricks.

Other Uses — These refractories are giving excellent service in oxygen steelmaking vessels and there seems to be good reason to believe that they would have much wider application. There have been some U. S. experiments with tar-bonded refractories in electric furnaces and open hearth furnaces.

Recently, Basic Inc. supplied a tar-bonded ramming mix for an electric furnace that is used for making high-speed tool steel using scheelite for the tungsten addition. This process causes more than ordinary wear on an electric furnace bottom. The tar-bonded ramming mix, which incidentally contains some magnesite as well as dead-burned dolomite, is doing well.

Expanding Mandrel Aligns Parts

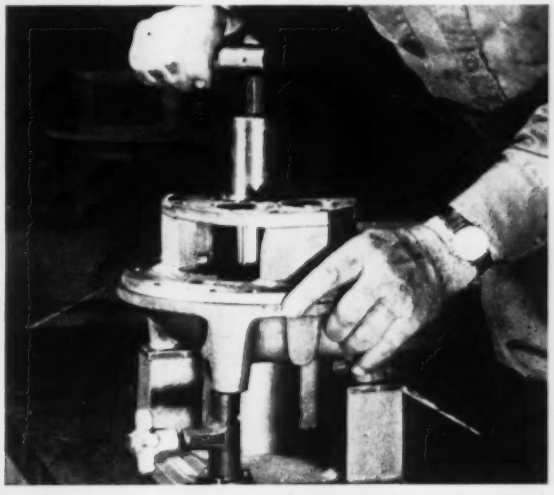
Accurate assembly of speed reducers prevents distortion of the parts. The centerlines of the frame and head must be located within a tolerance of 0.0007 in.

AN EXPANDING MANDREL is solving the problem of aligning frame and head bores in gear reducers before dowel pin holes are drilled and reamed. Precision placement of dowel pins is required to prevent the housings from cocking and twisting during the final assembly operation.

The bores of the frame and head are machined to a tolerance of 0.001 in. At least 0.001 in. clearance would be allowed on a ground plug, so the centerlines could be out of line 0.001 to 0.0015 in.

A 0.0007-in. alignment limit is demanded by customer requirements. It is met readily by using the expanding mandrel built by Scully-Jones & Co., Chicago. The mandrel's 0.003 in. expansion guarantees proper alignment, protecting the precision gearing, rigid frames, and leakproof oil seals.

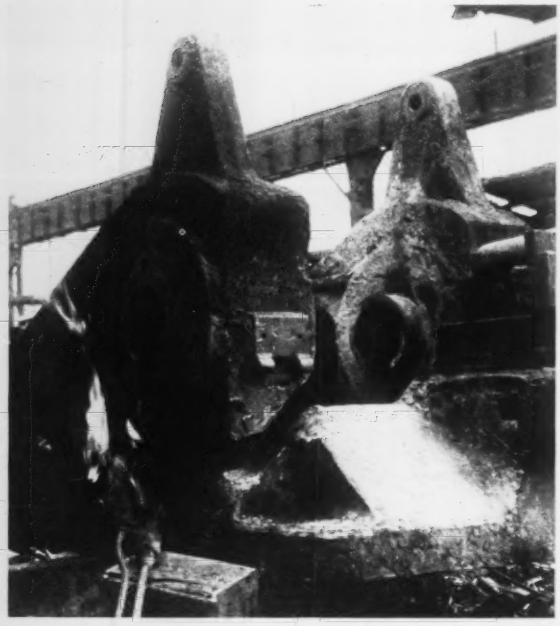
1. An expanding mandrel with a built-up chucking surface is inserted through the bore of the head

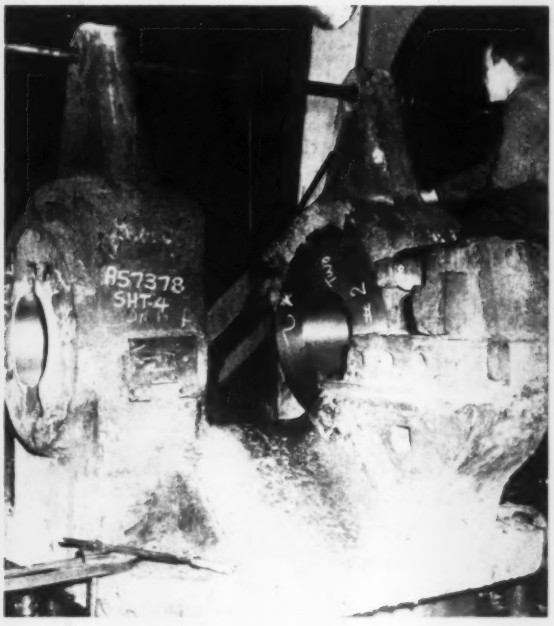


2. The assembler tightens the mandrel. This accurately aligns the bores of the frame and head

3. A ground plug is inserted into the driveshaft hole before lining up the seal bores

4. Bushings insure that the center distance between the mandrel and ground plug is correct





Broken alligator shear frame is shown partly filled with weld metal. Casting is repeatedly stress relieved. Final boring and facing of bearings complete the repair

Weld Reclaims Outsize Machine Part

Breaks too large to repair by ordinary methods are joined by a technique said to leave the weld stronger than the parent metal. It will handle most alloys

REPAIRING outsize castings costs only 10 per cent as much as a replacement part.

That's the reason a technique called Cyclic welding has been developed by Maintenance Engineering Corp., Pittsburgh. It is said to rejoin cracked parts with deposits that are equivalent to or better than the parent metal. Examples include major repairs to mill housings, reversing mill spindles, pinion and roll necks, forging hammer rams, press cylinders, and upsetter frames.

There appears to be no limit to the size of cross sections which can be handled, say experts. The method has proved itself on alloys like SAE 3135, SAE 4150, T-1, and carbon steels up to 1070. Where disassembly is costly, Cyclic welding can be done on the spot.

Example—Jones & Laughlin Steel Corp. has a large alligator shear at its Aliquippa (Pa.) Works. While reducing blooming mill billet scrap, it cracked between a bearing support and the base.

The cracked area was gouged out with a cutting torch (see illustration). Welders from Maintenance Engineering filled the open space 1 to 3 in. at a time. The entire area was stress relieved between deposits. Reboring and refacing the bearings completed the job.

Costs — Maintenance engineers figure that straight time and materials add up to $2-$2.50 per cubic inch of deposited metal. The alligator shear required about 1050 lb of metal. It has an average tensile strength of 100,000 psi.

Metal can be deposited any convenient way, although Maintenance Engineering likes low hydrogen electrodes, electricwelding, and submerged arcwelding.

Its engineers select electrodes with physicals higher than those of the parent metal. Deposits must be free of brittleness in the stress relieving temperature range. Regardless of the alloy, the weld is made under the critical temperature of the metal. The weld area is kept above 500° F until final stress relief.

Patent Limits Use—Members of the American Metal Repair Association are licensed by Maintenance Engineering to use the Cyclic method. If your need is urgent, you can do it yourself under the direction of a Maintenance representative.

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SAW STEELS

Sharon metallurgists have for the past decade concentrated on the development of better saw steels. As a result, they have established an industry-wide reputation for steels with a balance of toughness and hardness to absorb maximum punishment without fracturing or dulling.

It will pay you to contact your Sharon salesman and get the facts on these durable, edge-holding steels for saws or any cutting tool or implement.

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IRON OXIDE WHISKERS OFFER CORROSION CLUE

Crystals of alpha Fe_2O_3 (0.0012 in. long) form on Armco iron when it is exposed for 220 hours to dry oxygen. Scientists say solving the mechanics of their formation may lead to better protection. Electron micrograph X11,200

Source: Westinghouse.

PLATELETS GROW ON STRESSED STAINLESS

When you prestress Type 304 stainless to its elastic limit, heat it to 1100° F, and expose it to an oxygen-hydrochloric acid atmosphere for 138 hours, oxide crystals in the form of platelets result. Height: About 0.0004 in.

Source: Westinghouse.

Exploring the Frontiers of Corrosion

Scientists at Westinghouse search for unknowns with the vacuum microbalance, electron diffraction camera, and electron microscope. Here's a progress report

YOU may soon be able to predict the way a metal will corrode and know how to protect it properly before it's used.

Earl A. Gulbransen, advisory chemist, Westinghouse Research Laboratories, Pittsburgh, holds out hope that three research tools will provide the answers: The vacuum microbalance (for rates of oxidation and corrosion); the electron diffraction camera (for crystal structure and chemical composition of oxide films); and the electron microscope (for crystal habits of films).

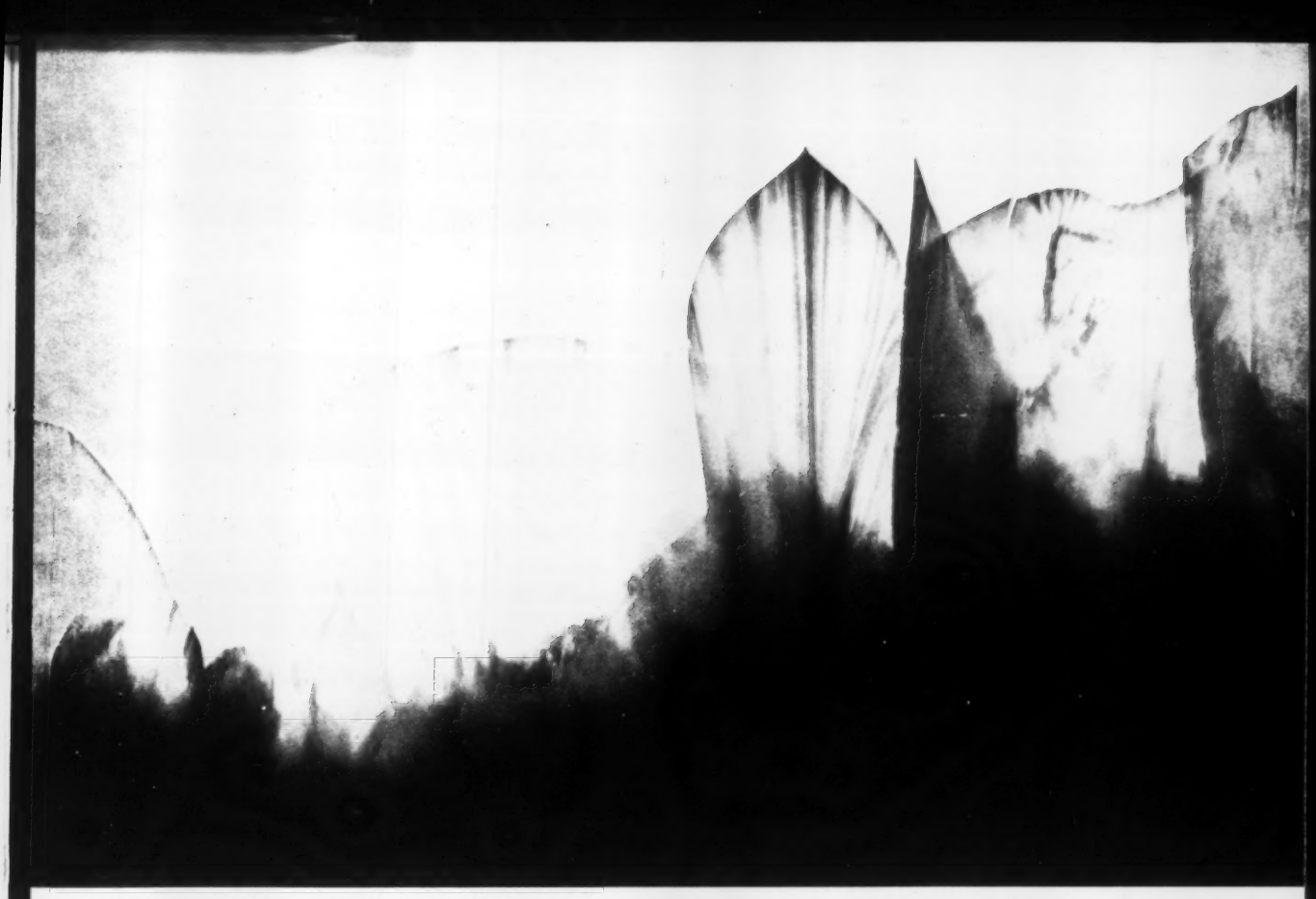
Mechanism—A thin film of corrosion inhibits further attack by oxygen, nitrogen, water, and other ions and molecules. If such films formed evenly, they would be a boon instead of a bane. When they fail, attack increases rapidly. Under tensile or shear stresses, localized reactions can produce cracks and failures (called stress corrosion cracking).

In most studies, metals are tested in a corrosive atmosphere, and the results are observed. You get practical answers, but basic information is not revealed—that's why the research tools cited are important.

Vacuum Microbalance—This device operates inside a vacuum reaction system. It can measure the weight of a single layer of oxygen atoms.

A thin sheet of metal is suspended from one end of the balance—a counterweight of the same metal is at the other end. A micrometer microscope checks balance movement. A pump evacuates the system for several hours; a furnace is raised around the tube and sample; and oxygen is added.

Example: The initial oxide film on pure iron is first removed by reduction with hydrogen at 77° F. After processing, the oxide thickness is 19 angstroms (about 0.075 millionths of an inch). It is not removed or reduced by the vacuum. The reaction rate is slow after the first pickup of oxygen.



Such experiments show how critically important just a few layers of oxygen atoms are in protecting metals.

Behavior Differs—Not all metals react the same way. Nickel was tried at 752 to 1382° F. The initial reaction was rapid, but the rate declined as the oxide film grew, until a certain temperature was reached (it varies with each metal). Then the reaction speeded up again. The mechanism is called breakaway corrosion. Eventually, the oxide cracks and crumbles.

At first, ion and electron movement through the oxide determines reaction rate. Resistance of any metal frequently depends on how well the oxide coating adheres to the metal.

Electron Diffraction—This is one way to learn something about crystal structure and the composition of the oxide film. Solids diffract high voltage electrons and x-rays. Electrons scatter a million times more than x-rays, so in the reflection method (the beam grazes a sample) penetration is limited to a few layers of surface atoms. That is why the method is so useful in studying the crystal structure of surfaces.

You have to prepare a surface carefully to get good quality patterns. Samples are carefully machined or ground, then precision abraded and cleaned. Reaction with oxygen is done in the camera.

The method has shown that the poor protective properties of iron can be related in part to transformation reactions during increases in temperature. (It runs from gamma Fe_2O_3 at 390° F to FeO at 1100° F.) Chromium and nickel form only one oxide over that temperature range and have much superior protective properties. Copper forms two oxides.

Electron Microscope Studies—The observations of geologists gave Westinghouse researchers an idea of how to study the mechanisms of corrosion. Like the geologists, they assume that stress corrosion cracks are due to highly localized chemical or electrochemical attacks. Local attack may be accelerated by stress or special ions like those of chlorine.

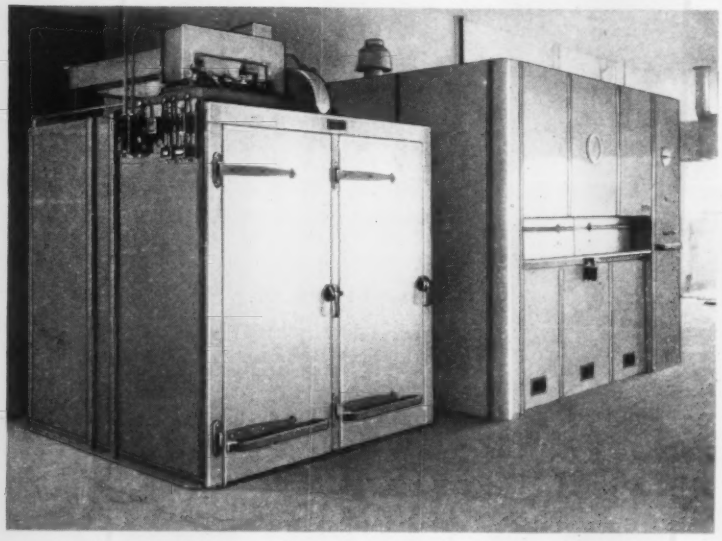
Direct transmission electron microscopy can be used to study crystal habits of corrosion products. Prepared gas atmospheres are passed over the samples supported in stainless steel specimen caps or mounted directly on a quartz rod in the furnace tube. (The laboratory oxygen supply is bubbled through a special solution.)

Small oxide whiskers form on Armco iron at 932° F. The thickness and length of the whiskers increase with reaction time. After 220 hours in dry oxygen, the oxide whiskers are about 0.0012 in. long and about 4 millionths of an inch thick.

What Happens to Stainless—Unstressed Type 304 gets small oxide whiskers in a heated oxygen atmosphere. They are smaller and fewer than those on Armco iron, but cover only a few areas.

Summing It Up—"We still have to find out the nature of the metal at the root of the whisker or platelets. If deep pits or trenches are formed, corrosion under stress has led to cutting of the metal," says Mr. Gulbransen.

Relative humidity of 90% fails to penetrate Rubatex in bakery "proof box" installations



Paul Reed Oven Company's Kansas City, Missouri, all-electric proof box for use in commercial bakeries to help dough rise in baked goods prior to placing in oven.

All wall and ceiling panels are fabricated of 1" R-103-S Rubatex Insulation Hardboard with .032 aluminum sheets bonded to both sides.

Dry temperature is held in proof box at approximately 110°F. and relative humidity at 90%. This high humidity soon penetrates most insulating materials. But, because Rubatex is impervious to moisture, there is no loss of insulating efficiency when used in proof boxes from small reach-in type to 32 rack monorail systems.

What's more, Rubatex does not allow for any fermentation action of bacteria inside unit panels—eliminating unsanitary conditions as well as objectionable odors.

The units are made in sections and assembled in the bakery. Rubatex eliminates the previous necessity with other materials of soldering edges of panels to prevent moisture from entering insulating core of panels. The light weight of Rubatex also adds up to considerable freight savings when shipping units to all parts of the United States.

RUBATEX
INSULATION HARDBOARD

RUBATEX DIVISION, Dept. S-9
GREAT AMERICAN INDUSTRIES, INC.
Bedford, Virginia

PIONEER MANUFACTURER OF CLOSED CELLULAR RUBBER

For full details and sample of Rubatex Insulation Hardboard—print your name in space below, attach to your company letterhead and mail to us.

Name

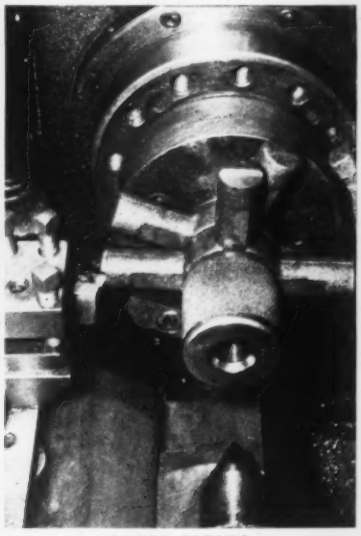
Send for Free Sample and Complete Details

Choosing Carbides

They can be expensive when not fitted to the job. This firm has almost halved costs

THE TYPE carbide you choose can make a big difference in your tool costs. In a recent comparison, it turned out that the right choice saved 47 per cent in tools, says Warner Automotive Parts Div., Borg-Warner Corp., Auburn, Ind.

The operation: Turning the spokes of automotive differential spiders to a 7 in. diameter.



SPIDER SPOKES
. . . are tough on carbide tools

Tough Operation—The differential spiders are nickel-chrome-molybdenum forgings (SAE 8620, 4620) which have four spokes that jolt the tool severely during turning. The job used to be done with prismatic inserts, reground ten times on each end. Square throwaway inserts (Kennametal KSBR-16 tools with K21 inserts) replaced vertically clamped triangular tools.

The old style inserts lasted for 5280 pieces, but the new inserts are cheaper even though they can handle only 680. The difference is in regrinding which is eliminated with throwaway types.

Feed Change — Machining was originally done on an 0.008-in. feed and a $\frac{1}{8}$-in. cut depth at 620 sfpm. That surface speed was reduced to 339 sfpm—feed and cut depth are the same.

Two forgings are turned in each setup in a 12-in. Fay automatic.

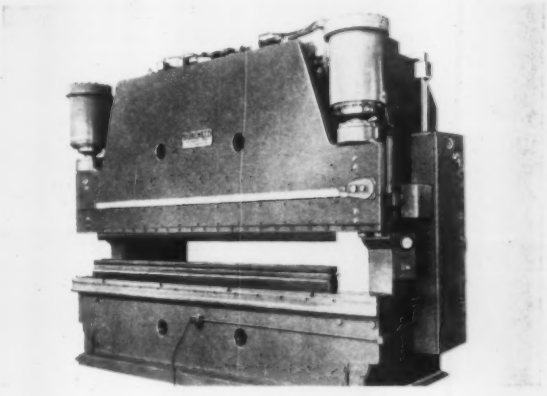
Constant Power Press Brake Cannot Be Overloaded

Steelweld press brakes bend mild steel from 10 gage to 2 in. thick and in lengths to 30 ft.

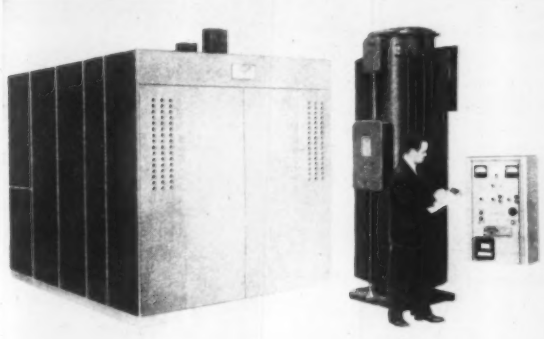
Because they are hydraulically operated, they cannot be overloaded. Regardless of work size put into the press, it will not be damaged—the ram will stop and can be backed away immediately.

Power is constant during the entire stroke, which varies from 12 in. for the smallest brake (rated at 200 tons), to 18 in. for the larger machines. Special longer stroke machines can be furnished.

The ram may be started, stopped, and reversed at any point in the stroke. The stroke may also be adjusted for any length and between any points within the limits of the machine. *Write*: Cleveland Crane & Engineering Co., Wickliffe, Ohio. *Phone*: Whitney 3-3700



Rectifier Permits Revere Current Etch Prior to Plating



A method of combining different semiconductor elements has led to a high amperage rectifier which permits an essential step to quality, reverse current etch, prior to chromium plating.

Output polarity of the power source must be reversed to obtain the etch in the plating bath. This rectifier permits reversal on units up to 10,000 amperes. It is actuated by a panel mounted switch, or a pushbutton operated, solenoid controlled air device. Model shown has remote controls and induction regulator.

Compared with equipment previously required for this application, investment runs as much as 50 per cent less. There are no moving parts to wear or get out of alignment. *Write*: Sel-Rex Corp., Nutley, N. J. *Phone*: Nutley 2-5200

Versatile Crack Detector Can Be Battery Operated

A low cost, portable magnetic crack detector, based on the principle of magnetic particle inspection, will immediately locate and outline any surface crack or fault on ferrous castings.

The unit weighs 20 lb and is operated by one man. It can be run from a 110 volt, alternating current line or a 12 or 6 volt battery. This makes crack inspection possible in areas where electrical lines are unavailable or not permitted.

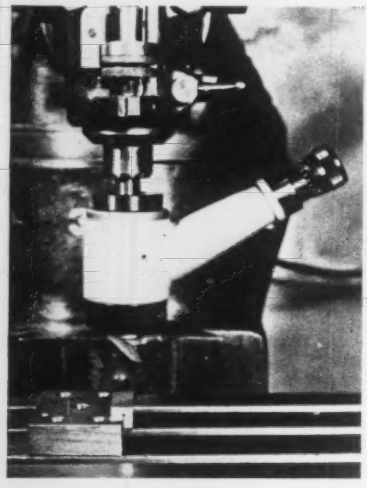
The detector unit includes probe, alternating and direct current connectors, sprinkling bulbs, magnetic powders, complete operating instructions, and a steel carrying case. *Write*: United States Casting Repair Corp., 2500 E. York St., Philadelphia 25, Pa. *Phone*: Garfield 5-3654

NEW PRODUCTS and equipment

Precise Work Positioning

A centering microscope enables machinists to locate tool spindles precisely over the work. Centering the work to within 0.0005 in. before making a cut, the unit eliminates false starts from imperfect jigging.

Mounted in the machine spindle chuck, the microscope optically extends the true center line of any drill, borer, miller, lathe, or tapper spindle.



By sighting through the 25-power unit, the machinist brings a point, edge, hole, or a scribed line on the work into exact alignment with the true spindle axis. *Write*: F. T. Griswold Mfg. Co., 315 W. Lancaster Ave., Wayne, Pa. *Phone*: Murry 8-4080

Conveyor Has Live Rollers

A horizontal live roller conveyor unit handles medium-duty jobs where there is considerable accumulation of cases and cartons. It provides freedom from breakage. Rollers are $1\frac{3}{4}$ in. in diameter.

Light spring pressure keeps the drive belt against the carrier rollers. Slight downward pressure releases anything that gets caught between rollers and belt.

The unit is capable of speeds ranging from 22 to 100 fpm with a load capacity of 25 lb per foot of conveyor length. Standard is 56 fpm.

Sections come in lengths of 5 or

10 ft; maximum unit length is 100 ft. Rollers come in widths of 12, 18, or 24 in. and may be set above or below the frame. *Write*: Rapids-Standard Co. Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich. *Phone*: Glendale 9-0281

Lift Truck Use Increased

This operator-led low lift, called a Transporter, may be equipped with an auxiliary platform which can be folded back and held upright so that the truck can move pallets—or the platform can be lowered over the forks and converted into a pallet or skid handler.

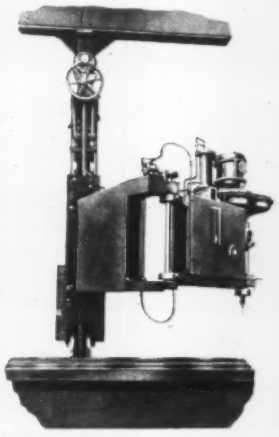
The unit is available in lowered heights of 6 to 11 in. in 1 in. increments to slip under skids. Width of the truck's forks determines width of the adapter. The superstructure can be made longer than the forks

if necessary. *Write*: Automatic Transportation Co., division of Yale & Towne Mfg. Co., 149 W. 87th St., Chicago 20, Ill. *Phone*: Radcliffe 3-7000

Drill Has Hinged Arm

This wall radial drill is primarily for drilling plates, angles, and beam flanges too heavy to punch.

It is a column-mounted unit arranged for vertical travel on the column and with radial coverage provided by a double-hinged radial arm. Various spindle speeds are provided; feed is pneumatically powered.



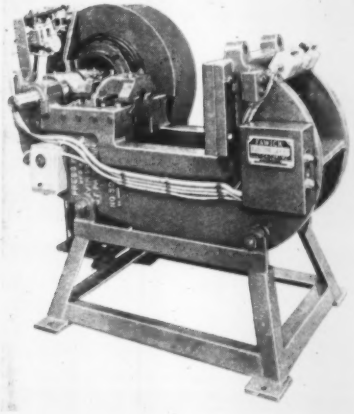
It will take up to a 2 in. diameter drill in mild steel. Vertical travel on the column is 48 in. The two-part radial arm is 12 ft long. *Write*: Thomas Machine Mfg. Co., Pittsburgh 23, Pa. *Phone*: Sterling 1-5800

Press Operation Improved

Ejecting lightweight pieces stamped at high speed is greatly simplified by the horizontal mounting of a 30-ton O.B.I. press.

This fabricated steel base provides a solid footing for mounting. A motor mount is built in the base and provided with an adjustment for belt tension.

Operating controls are placed conveniently at the front of the ma-



chine. *Write*: Press-Rite Div., Sales Service Machine Tool Co., 2563 University Ave., St. Paul 14, Minn. *Phone*: Midway 6-8663

Production Shown Quickly

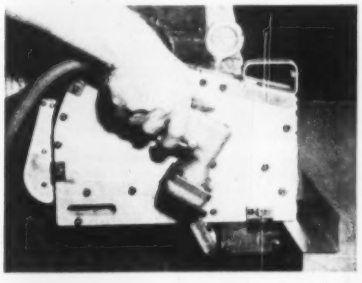
A simple and accurate efficiency recorder for management, engineers, and operators shows productive time as well as downtime. It is continuously readable in percentage of time over the entire shift.

During idle time, the line on the chart becomes broad and conspicuous. *Write*: Gorrell & Gorrell, Westwood, N. J. *Phone*: North 4-7757

Metal Stapler Portable

This pneumatic stapler has high penetration power for metal stitching and other heavy-duty fastening. It is portable.

The P-10 will staple such materials as steel (including stainless and galvanized), copper, aluminum, rubber, plastics, and fibers—like to like or in combinations.

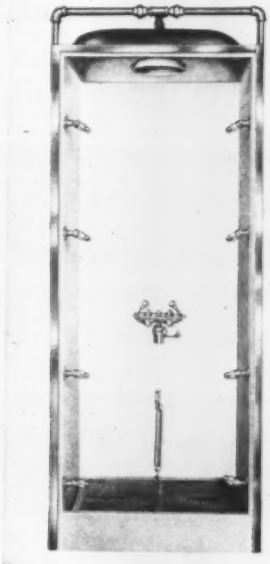


The unit weighs 24 lb and requires 75 to 90 psi air pressure. *Write*: Bostitch, 2002 Briggs Dr., East Greenwich, R. I. *Phone*: Turner 4-2500

Decontamination Rapid

All emergency safety facilities operate instantaneously when a worker enters this Model 8600 decontamination booth.

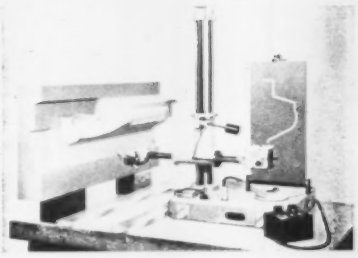
A drench shower unit washes away acids or other injurious materials, and a controlled pressure fountain is provided to cleanse eyes and face.



The floor of the Fiberglas stall serves as a treadle which activates the unit. *Write*: Haws Drinking Faucet Co., Fourth and Page Streets, Berkeley 10, Calif. *Phone*: Landscape 5-5801

Contours Recorded Fast

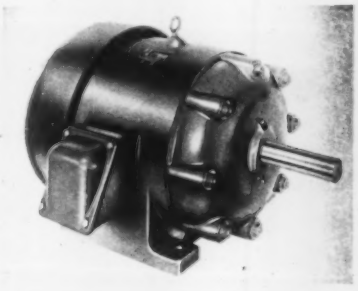
Nondestructive sectioning of contoured parts is possible with the OGP contour transcriber, Model 8-18. Contours of master patterns, models, dies, molds, and similar parts are permanently recorded on specially coated glass, called a "trace." Traces can be made of exterior and interior part contours, top and bottom halves of a die, and mating parts.



The device is for rapid, semiautomatic operation and handles contours up to 8 in. deep by 18 in. long. *Write*: Optical Gaging Products Inc., 26 Forbes St., Rochester 11, N. Y. *Phone*: Fairview 8-9090

Aluminum Houses Motors

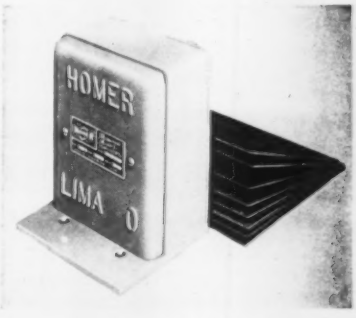
Motors housed in heat-treated aluminum alloys need no external cooling fins because of the heat transfer characteristics of the metal. They have been accepted as explosion-proof by Underwriters Laboratories Inc.



The absence of dust collecting fins makes the motors desirable for use in dirty atmospheres. *Write*: Electra Motors Inc., 1110 N. Lemon St., Anaheim, Calif. *Phone*: Keystone 5-6061

Separator Line Increased

Three magnetic sheet separators, Model 1175 Size 7, Model 1300 Size 12, and Model 1400 Size 12, round out this line and provide all prac-

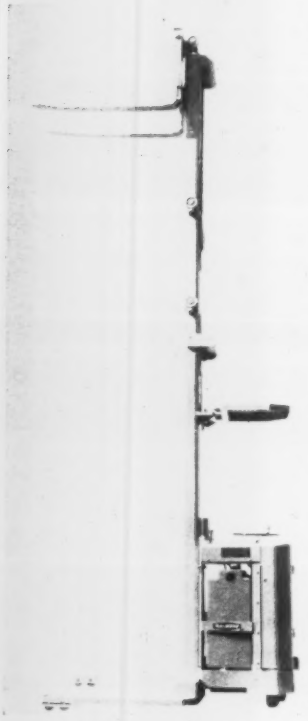


tical sizes for users of such equipment.

Cast aluminum frames have been replaced by Amalloy and primary aluminum-magnesium-titanium casting alloy to eliminate fracturing of frames when separators are secured to machines. *Write*: Dept. 149, Homer Mfg. Div., Ohio Electric Mfg. Co., Lima, Ohio. *Phone*: Montrose 2-8484

Truck for Narrow Aisles

An electric truck for use in aisles as narrow as 78 in. stacks 4000-lb pallet loads as high as 192 in. Space formerly wasted is put to work.

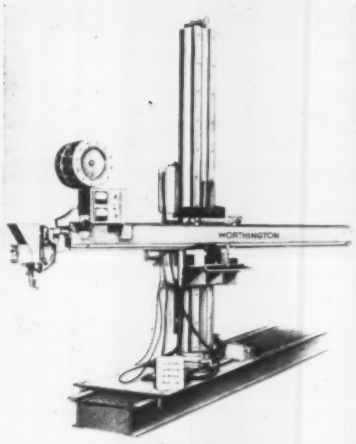


Outrigger base legs, combined with the 200-degree steering arc of the offset drive wheel, make close maneuvering possible. *Write*: Raymond Corp., 91-165 Madison Ave., Greene, N. Y. *Phone*: 204

Welding Head Controlled

This automatic welding head manipulator offers increased production and accuracy and is manufactured in sizes from 6 x 6 to 12 x 12.

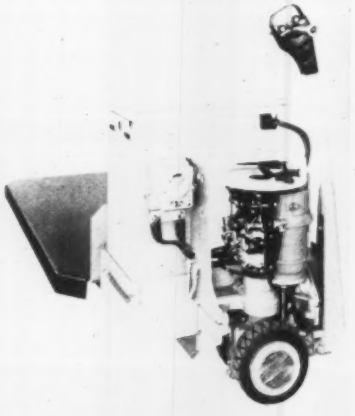
The roller clusters grip three



ways, giving alignment throughout operation. *Write*: Positioning Equipment Dept., Worthington Corp., Plainfield, N. J. *Phone*: Humboldt 4-1234

Truck for Heavy Duty

This truck has a capacity of 8000 lb with a platform width of 42 in. Standard width is 27 in.



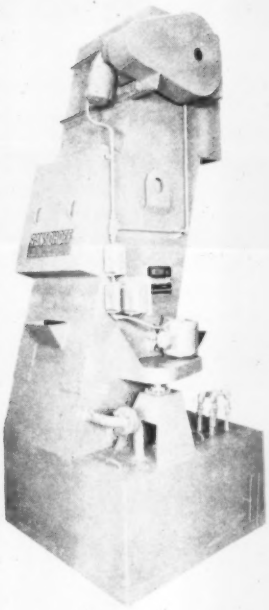
The trail axle carries four 6 x 5 Formica wheels. All controls are in the steering handle. *Write*: Lift Trucks Inc., Cincinnati 14, Ohio.

Washer Saves Space

A vertical, conveyor type, part washing machine takes little floor space. Operation is simple, spillproof, and automatic.

The solution tank is heated by removable steam plate coils but it can be designed for gas or electric heating.

The machine is 4 ft wide, 4 ft long, and 11 ft high. Production rate is 2000 pieces an hour. *Write*:



Ransohoff Inc., N. Fifth Street and Ford Boulevard, Hamilton, Ohio. *Phone*: Twinbrook 3-5813

Drum Handler Fits Lift

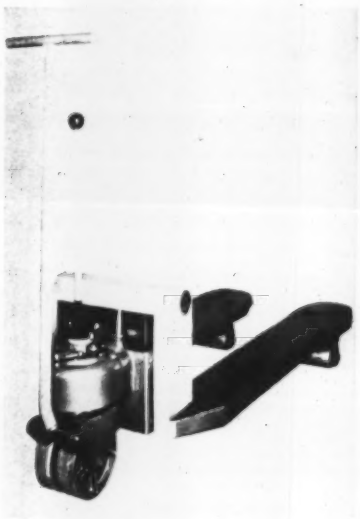
An automatic drum handling attachment for Moto-Bug fork lifts fits easily on the carriage of Model S-10 or the larger R-18.

Equipped with the attachment, the Model S-10 has a 1000-lb capacity; the R-18, 1500 lb.

The unit takes up only a few inches more space than the drum being handled and can be operated in narrow aisles. *Write*: Kwik-Mix Co., Port Washington, Wis. *Phone*: Uptown 3-4500

Lift Truck Maneuverable

This intermediate range, double faced, lift truck (2500-lb capacity) permits maximum maneuverability



where space is limited. *Write*: Special Products Div., Colson Corp., Somerville, Mass. *Phone*: Somerset 6-3025

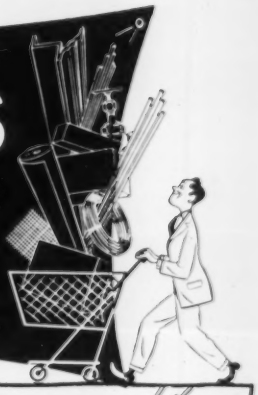
Hydraulic Impact Wrench

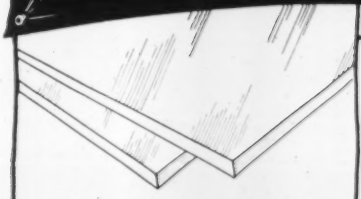
This wrench has a 1-in. drive and exerts up to 900 to 1000 ft-lb of torque.

It operates from a hydraulic pow-

er source up to 6.5 gpm at 1000 psi producing about 1200 impacts a minute. The unit will eliminate the need for an air compressor or an electric power source. *Write*: Owatonna Tool Co., 398 Cedar St., Owatonna, Minn. *Phone*: 2338

PLUS ITEMS
from your Whitehead Metals "Supermarkets"





TOOL AND JIG PLATES

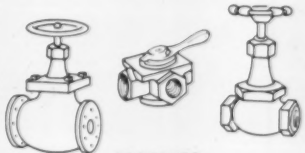
Of Alcoa Aluminum, they are stress relieved, non-porous, corrosion-resistant, easily machined. Available in standard size (48" X 96") in 13 thicknesses; or cut to your specifications. Folder available.

WELDING ROD

One-stop service for all you need in Aluminum, Copper Alloys, Nickel Alloys and all major types of welding rod and wire. A full line of soft solders and silver brazing alloys, too. Technical service and complete literature on request.

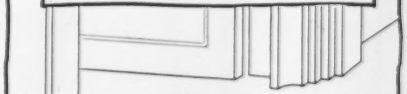
FOUNDRY ALLOYS

Over 100 different types—largest selection in the industry—available in handfuls or carloads off-the-shelf. Technical service, too. Write for "Foundry Alloy" Bulletin FA1.



VALVES

All major types are available from stock in Aluminum, Inconel, Monel, Nickel and Stainless Steel (and plastics, too). Write for descriptive literature.



ARCHITECTURAL SHAPES

Copings, gravel stops and door saddles are just a few of more than two hundred Alcoa aluminum shapes available off the shelf, and illustrated in booklet titled "Shapes." Monel, Stainless and Copper roofing items complete the Whitehead line of architectural materials on hand.

These "Plus Items" and many more are available in addition to a wide selection of corrosion-resistant sheet, rod and tube.

All told, there are more than 20,000 items distributed and serviced by Whitehead. All are available, off-the-shelf, from the nine Whitehead Metal "Supermarkets." All are the products of such leading producers as Alcoa, Anaconda, Inco & Crucible Steel to name just a few.

When you call Whitehead you get fast service, and frank, unbiased help in selection. Technical service when you need it. Add it up and you'll find it pays to

Call **WHITEHEAD**
METAL PRODUCTS COMPANY, INC.
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ROCHESTER • WINDSOR, CONN.

NEW literature

Write directly to the company for a copy

Fabricated Products

This catalog details such items as tanks, housings, panel boards, weldments, bases, powerplants, machine pans and guards, and special shapes and forms. Littleford Bros. Inc., 457 E. Pearl St., Cincinnati 2, Ohio.

Tube-Type Motors

Those with capsule mounted, split-sleeve bearings are described in a 7-page bulletin. Discussed are the heat exchanger system, and construction of bearings, frame, stator, and rotor. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Automatic Lathes

Details are given in a 20-page catalog. Discussed are basic machine operations and 39 job applications. Gisholt Machine Co., Madison 10, Wis.

Blower and Compressor

An axial flow, positive displacement blower and compressor is discussed in a 4-page brochure. Features of the Cyclo-Blower are clean air or gas delivery, shock-free compression, high capacity, and low unit weight. U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.

Automated Machine Tools

A 20-page catalog describes automated special machine tools for low, medium, and high production operations. It divides machine tools into generic types and outlines production parts, operations, and rate schedules to which they are applicable. Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich.

Steel Strapping Tool

An 8-page booklet covers a fully powered combination tool. Applications, operating instructions, and specifications are given. The Acme Steel A4 Pneumatic Steelstrapper tightens, seals, and cuts. Acme Steel Co., 135th Street and Perry Avenue, Chicago 27, Ill.

Cobalt-Base Alloys

Two 16-page booklets describe cobalt base, high temperature alloys used mainly in the form of investment castings. Discussed are Haynes Stellite alloy No. 21 and Haynes Stellite alloy No. 31. Haynes Stellite Co., a division of Union Carbide Corp., 30-20 Thomson Ave., Long Island City 1, N. Y.

Press Room Equipment

Catalog No. 85 describes automatic equipment. Included are slide feeds, roll feeds, air-operated feeds, stock straighteners, stock reels, coil cradles, combination cradles and straighteners. U. S. Tool Co., Ampere (East Orange), N. J.

Hand Lift Trucks

A selector chart is included in Circular 26B. It gives tips on where and how hand lift trucks are best utilized. Dept. R8-12, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass.

Machine Welding

A 6-page brochure describes the function and services of Airco's Machine Welding Dept. Included is information relative to installations custom engineered by the department. Air Reduction Sales Co., a division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y.

Hydrogen Production

A 36-page booklet describes processes, types of plants, methods of purification, and industrial applications. Girdler Construction Div., Chemetron Corp., Box 174, Louisville 1, Ky.

Stainless Steels

A series of data sheets covers 17 types. An accompanying 8-page guide indicates corrosion resistance to chemical media. The 4-page data sheets discuss factors such as chemical composition, applications, processing, physical properties, mechanical properties, machining, forming, and welding. Stainless Steel Div., Jones & Laughlin Steel Corp., Box 4606, Detroit 34, Mich.

Screw Machine Blanks

"How To Get Better Critical Parts at Cost-Saving Prices" is the first in a new series of bulletins. It details design, production, and application data on screw machine blanks for making hydraulic pump pistons. National Screw Machine Products Association, 2860 E. 130th St., Cleveland 20, Ohio.

Colloidal Graphite

"The ABCs of Colloidal Dispersions" is a 12-page booklet. Sections are devoted to graphite, colloidal graphite, colloidal dispersion vs. dry powder, graphite dispersion in various fluids, and molybdenum disulfide. Acheson Colloids Co., Port Huron, Mich.

Rubber Insulated Cables

Special properties of silicone rubber insulated cables are described in a 15-page booklet. National Electric Products Corp., 2 Gateway Center, Pittsburgh 22, Pa.

Gasoline Engines

Three bulletins describe four cycle, V-angle engines. Included are Models PJVG (220 to 295 hp), PSVG (408 to 816 hp), and PKVG (880 to 1760 hp). Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Clutches and Brakes

Magnetic types and their applications are discussed in an 8-page booklet. Included is information to assist engineers in planning an installation. Fawick Airflex Div., Fawick Corp., 9919 Clinton Rd., Cleveland 11, Ohio.

Granite Surface Plates

Reconditioning worn plates is outlined in a brochure. Included is a method for calibrating wear, formulas for determining cost, grinding out nicks, care of plates, and packing and shipping instructions. Rahn Granite Surface Plate Co., 641 N. Western Ave., Dayton 7, Ohio.

Bearing Material

Brochure No. DU-458 describes a self-lubricated bearing material and its advantages. Also included are test and field service data. United States Gasket Co., division of Garlock Packing Co., Camden 1, N. J.

Grinder Controls

A 4-page bulletin describes automatic grinder controls for ID, OD, and surface grinding. Accessory equipment and other automated control equipment are also listed. Radio Corp. of America, Building 15-1, Camden, N. J.

Oxidation Protection

A bulletin describes protection of molybdenum against oxidation up to 3400° F for short periods and up to 2300° F for shorter periods. Detailed is a surface alloying technique for increasing heat, wear, and corrosion resistance. Chromalloy Corp., 450 Tarrytown Rd., White Plains, N. Y.

Marking Machines

Blast etch marking machines are detailed in Bulletins 146-C25 and 146-C26. They mark with a blast of fine aluminum oxide grit blown through a stencil-like rubber mask. Jas. H. Matthews & Co., 3746 Forbes Ave., Pittsburgh 13, Pa.

Ultrasonic Cleaning

A 24-page bulletin (No. S-200) explains ultrasonic cleaning. Branson Ultrasonic Corp., 40 Brown House Rd., Stamford, Conn.

Stationary Compressors

Heavy-duty high pressure stationary compressors are described in an 8-page bulletin. Included are specifications on four basic high pressure models ranging in capacity from 368 to 2000 cfm. Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.

Material Handling

Three bulletins describe standards for manual material handling equipment. Included in Bulletin CFT-PT1-58 are specifications for platform trucks. Bulletin CFT-W4-58 covers specifications for rubber wheels, and Bulletin CFT-W5-58 those for semipneumatic tired wheels. Caster & Floor Truck Manufacturers' Association, 27 E. Monroe St., Chicago 3, Ill.

Phillips Screws

A booklet gives information on all Phillips cross-recessed head screws in standard production or obtainable from approved tooling. Screw Research Association Office, 1015 Chestnut St., Philadelphia 7, Pa.

"Joe Magarac" Puts On The 3000 Ton Squeeze

Like he had four hands, this mighty man of steel grabs a white hot 90 inch 120 ton ingot . . . kneads, rolls, forges it to relative length and size . . . for what? A 50 ton bending roll . . . a 40 ton turbine rotor . . . a tough forged steel shaft to drive an ocean liner or aircraft carrier . . . a rugged spindle for a rolling mill? Joe doesn't know—he just bears down with his 3000 ton 4 way squeeze. The Quality Control men know. If Joe could hear, they'd tell him.

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(Advertisement)

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER III—Lustrous, Corrosion-Resistant Finishing with Chemical Polishing Iridite

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are widely accepted throughout industry as an economical means of providing corrosion protection, a good base for paint and decorative finishes for non-ferrous metals. Certain of these coatings also possess chemical polishing abilities that have luster-producing, as well as corrosion-inhibiting, effects on zinc and cadmium plate, zinc die castings and copper alloys. However, continued developments in this field have been so rapid that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this discussion of the many ways in which this chemical polishing characteristic can be used in final finishing or pre-plating treatments to produce a lustrous appearance with distinct display and sales appeal and appreciable savings in cost. Report I on decorative, corrosion-resistant finishes and Report II on paint base corrosion-resistant finishes are available on request.

The degree of luster possible on a surface is a function of the degree to which the surface can be smoothed. Leveling to provide a smooth surface can be achieved by mechanical or chemical means, or a combination of these, depending upon the luster desired and the original condition of the metal. Chemical polishing effectively imparts luster otherwise difficult and costly to obtain. For this reason, it is often used to supplement or entirely replace mechanical polishing, depending upon the application and the original condition of the metal. Chemical polishing has the additional advantage of providing overall treatment of the submerged part. It reaches into even the deepest corners and recesses that are otherwise inaccessible. Certain of the Iridites are specifically designed to perform this chemical polishing operation. Also, they provide corrosion protection as do all Iridites, thus may be used as a final finish or a pre-plating polish.

If Iridite is to be used as a final finish, in contrast to pre-plating treatment, the chromate conversion coating generated is allowed to remain, providing good corrosion resistance. Color inherent in these Iridite films ranges from a yellow cast to yellow iridescent. These coatings may be used without further treatment where this color is acceptable and good corrosion resistance is desired. Further, these basic coatings can be tinted by dyeing. Among the dye tints available are shades of red, yellow, blue and green. If desirable, the basic coatings can also be modified by a bleach dip leaving a clear bright or blue iridescent finish. In all cases bleaching reduces corrosion resistance.

As examples of this type of final finishing, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, lustrous chemical polishing of the as-cast surface of zinc die castings. Thus, in many cases, sizeable savings in finishing cost are realized by elimination of plating costs. This economical method can be used on tools, appliance parts, toy pistols, locks and many other small castings. Another example is the treatment of copper and brass parts, such as welding tips, to eliminate buffing and provide additional corrosion resistance. In many cases, handling costs are reduced appreciably by replacing piece-part handling with bulk processing. Still another example of the use of this chemical polishing and protective quality of Iridite is a simple system of zinc plate, Iridite and clear lacquer instead of more costly electroplated finishes. Typical of this type of lustrous finish are builders hardware and wire goods.

As a pre-plating treatment, in contrast to final finishes, Iridite can be used to chemically polish zinc die castings or copper prior to plating. In such cases, Iridite should be applied as an in-process step, so that the protective film is removed before the plating cycle. The savings in handling, material and labor costs are obvious. This process has made it practical to plate chrome directly over copper on steel, conserving nickel, yet producing a lustrous chrome finish. Used after stripping faulty plate in reprocessing zinc die castings, Iridite restores luster to the casting, thus making possible replating without blistering.

Other Iridite finishes are available to produce maximum corrosion resistance, a wide variety of decorative finishes and excellent bases for paint on all commercial forms of the more commonly used non-ferrous metals. As a final finish, appearance ranges from clear bright to olive drab and brown and many films can be bleached or dyed. As a paint base Iridite provides excellent initial and retentive paint adhesion and a self-healing property which protects bare metal if exposed by scratching. Iridites have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of their top performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product demands the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.

Market Outlook

Industry Needs Higher Prices

A STEEL price increase of $5.75 a ton is mandatory if the industry is to maintain first quarter earnings of 5 cents on the sales dollar. Failure to raise prices would drive second half earnings down to 3.4 per cent of sales.

First quarter earnings were the lowest since 1952, so any talk of the industry absorbing all the higher employment costs seems absurd.

During the second half, production will be about 47 million tons of steel for ingots and castings (vs. 38 million in the first half). About 34 million tons of finished steel will be shipped. If prices (averaging $160 a ton) and wages remained at first half levels, sales would be $5.4 billion—of which 90 per cent ($4.9 billion) would be pretax costs and 10 per cent ($544 million) would be pretax profit. Profit after taxes: $272 million or 5 per cent of sales.

EMPLOYMENT COSTS RISE— Last week, employment costs went up about 25 cents an hour or $5 a ton (20 manhours for each ton). Result: 34 million tons cost $170 million more to produce than they would have during the first half. Subtracting $170 million from $544 million (the profit anticipated at old wage rates) leaves a pretax margin of $374 million. Profit after taxes: $187 million or 3.4 per cent of sales.

NEEDED: MORE THAN $5— If prices were advanced just $5 to match labor cost increases, profits would be 4.8 per cent of sales.

To maintain first quarter earnings (5 per cent), steelmakers must raise prices at least $5.75 a ton. They'll still have trouble because suppliers' labor costs will also rise. Purchased goods and services will carry bigger price tags. By yearend, the $5-a-ton labor increase will have a $10 per ton impact on the cost of making steel.

HIGHER PRICES, ANYONE?— Traditionally the price leader, U. S. Steel Corp. wants no part of its accustomed role. Alan Wood Steel Co. took the hint (its prices are tentatively scheduled to jump an average $6 a ton today), but larger producers seem determined to wait out the corporation. Avery C. Adams, president of Jones & Laughlin Steel Corp., expressed a widely held opinion when he called it "commercial suicide" to change without such action by U. S. Steel.

"CLARIFICATION" AWAITED— Presumably, U. S. Steel would feel better about announcing higher prices if demand were greater, but there's slim chance of improvement before August. The corporation may also be asking itself: What effect would a price rise now have on the sale July 16 of $300 million worth of its sinking fund debentures? What provocation would the boost give to Sen. Estes Kefauver (D., Tenn.) to launch a damaging attack?

PRODUCTION TAKES HOLIDAY— Obliged to pay their employees double time and a quarter for holiday work, steelmakers ran their plants with skeleton crews on July 4. As a result, operations last week fell 10 points to 53 per cent of capacity. Production hit about 1,430,000 net tons of steel for ingots and castings.

JULY OUTLOOK IMPROVED— Shipments will be substantially lower this month than in June, but prospects are improving. Delayed price hike announcements set the stage for more hedging. Automotive sheet buying is still weak, but stainless producers feel the impact of model changes. Demand for tin plate, galvanized sheets, and reinforcing bars is helping to sustain the market. STEEL's composite scrap price rose 67 cents last week to $35.67 on the strength of Chicago sales.

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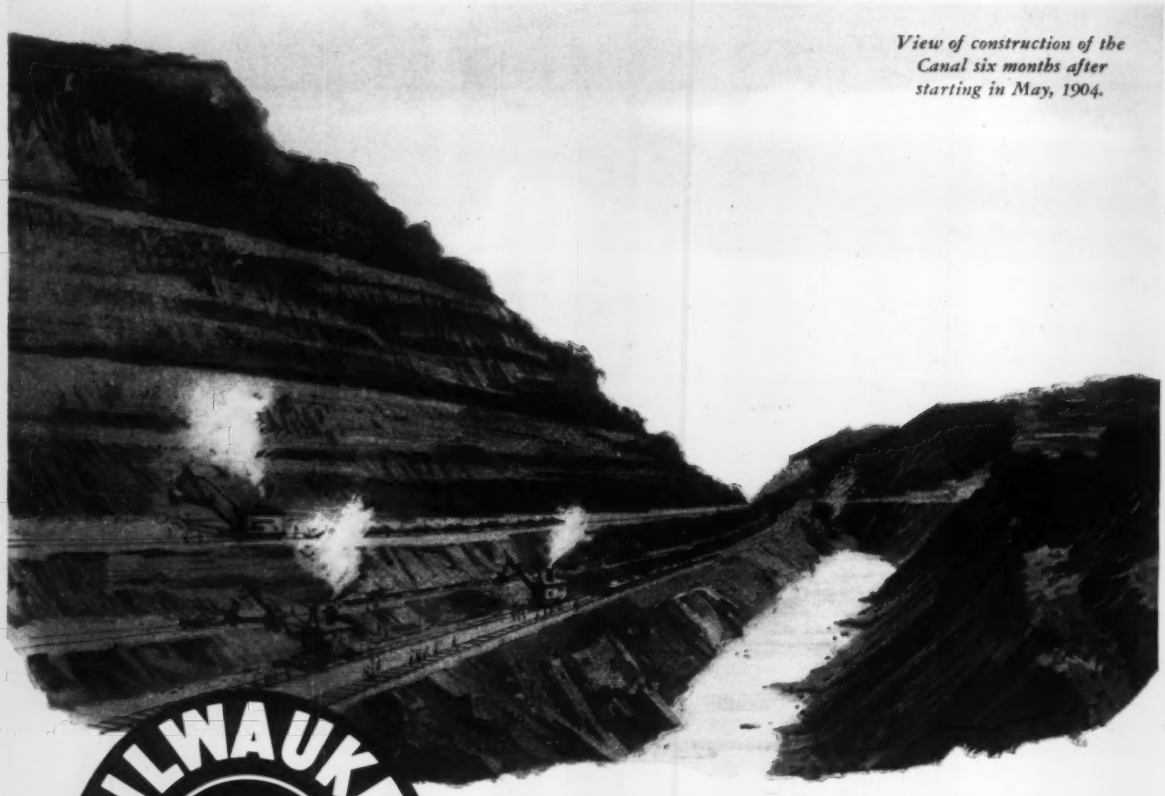

View of construction of the Canal six months after starting in May, 1904.

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STEEL
QUARTERLY SURVEY

COMPONENTS	CURRENT INVENTORIES					3rd Quarter FORECAST		
	UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS	LOWER	SAME	HIGHER
CASTINGS . . . . . Die, gray iron, malleable, nonferrous, steel.	5%	24%	51%	16%	4%	18%	65%	17%
OTHER FORMED COMPONENTS . . . . Forgings, stampings, springs, wire shapes.	4%	22%	34%	32%	8%	17%	70%	13%
MACHINED COMPONENTS . . . . . Bearings, couplings, cylinders, gears, screw machine products.	5%	20%	41%	25%	9%	21%	64%	15%
ELECTRICAL EQUIPMENT, MOTORS . .	12%	30%	36%	11%	11%	22%	63%	15%
FASTENERS	1%	29%	41%	25%	4%	16%	69%	15%
MECHANICAL RUBBER GOODS, BELTING	7%	33%	39%	18%	3%	22%	65%	13%

FIGURES are percentages of respondents to STEEL's quarterly survey.
COLOR UNDERSCORED figures show how most respondents reported.

Stocks Reach 'Satisfactory' Levels

Most component buyers say they won't trim inventories in third quarter. Except in capital equipment and construction industries, they order as much as they use

MORE USERS of components will add to their stocks in the third quarter, putting the brakes on an inventory-trimming trend that has been in operation for six months. Look for sales to improve soon.

Buyers are thinking twice before slashing deeper into inventories, STEEL's quarterly survey of components shows. As a Philadelphia buyer of formed and machined components puts it: "We will increase our inventory in the next three months to make it more workable. Our stocks were dangerously low in early second quarter."

Purchasers of castings, stampings, springs, wire shapes, and fasteners plan no significant change in inventory policies this quarter. Most will continue to hold a 30 to 60 day supply.

Some Still Trim—About one in five buyers of machined components, electrical equipment, forgings, and mechanical rubber goods will reduce inventories in the third quarter. Another 15 per cent will add to stocks, basing their decision on the possibility of supply shortages or expectations of sales gains later in the year.

Castings illustrate how an end to inventory reductions can help sellers. Many users lived off inventories in the second quarter. Some 35 per cent told STEEL they reduced stocks in that period. Only 7 per cent added to them. In the third quarter, buying will equal use. While 18 per cent of purchasers will trim inventories, 17 per cent will add to them.

Sellers of fasteners will benefit, too. One user in three cut stocks last quarter. About 6 per cent added to them. Now only 16 per cent say they are planning reductions; 15 per cent will build their inventories.

Satisfaction Shows — Buyers are more pleased with inventory levels than they were early this year, the survey shows. In early first quarter (STEEL, Jan. 6, p. 485), 26 per cent of respondents predicted lower inventories in the next quarter, while 61 per cent planned no change. In early second quarter (STEEL, Apr. 7, p. 137), 22 per cent expected lower stocks, while 63 per cent planned no change. Now 19 per cent think stocks will drop, 15 per cent believe they will be higher, and 66 per cent predict no change in the next three months.

Excessive inventories are no longer a problem for the great majority of buyers, although 13 per cent of purchasers of electric motors over 5 hp and 11 per cent of buyers of forgings say their inventories exceed needs.

All respondents agree that deliveries are adequate, but some

buyers of electrical equipment complain that they are slow. Users of steel and malleable castings and stampings report spot shortages.

Two Groups Cut Buying—Inventory trimming will continue in capital equipment and the construction industries, respondents indicate. An Ohio steel plant equipment supplier says: "We expect our orders and shipments to drop in the third quarter, due to summer slowdowns in the steel industry. As a result, we will make more reductions in inventories."

A New Jersey purchasing agent reports: "We sell to the construction industry. Our sales drop seasonally in the last quarter, and our inventories begin to decline in the third quarter."

While those industries will probably hold down component buying in the third quarter, an increasing number of buyers agree with a Wisconsin purchasing agent who comments: "We cut stocks to the point where our own operations suffered last quarter. We'll buy more this quarter."

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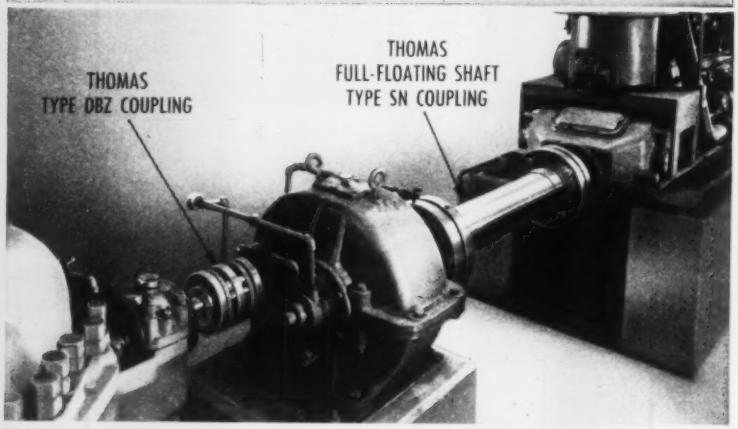

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Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 106 & 107

Whether the delay in advancing prices will spark more hedge buying remains to be seen. Last week was slow because of the holiday and suspensions for vacations. Business will probably be spotty through July, especially with quick mill shipments available—two weeks on hot-rolled sheets and three to four on cold rolled.

Steelmakers are maintaining a wait-and-see policy regarding prices. Larger makers indicate no immediate change despite the announcement by Alan Wood Steel Co. that it would raise its prices July 7—if other makers took similar action. Hot-rolled sheets were scheduled to go up $6 a ton, cold rolled $7.

Inventories are still being reduced. There should be a pickup in ordering when reductions end. July, though, is likely to be the low month of the year for many mills. That's because of shove-ahead tonnage placed in June, and July plant closings for vacations—some will be longer than the usual two weeks.

Substantial Bookings — A Pittsburgh mill reports its June order book was the best since October. The producer said: "It's impossible to say what part should be ascribed to hedge buying, but the consensus is that it wasn't high. May had been our best shipping month, but we'll top that by 15 per cent in June. Bookings for July will be lower but won't take as much of a dip as we had feared."

None of the major sheet consuming markets is showing much life. There is little activity in automotive sheets. Carbuilders are not going to let their inventories get too high. Stocks are reported to be as low as 12 days. Chances are the automen will not do much steel buying for 1959 models until their labor situation is clarified. They don't intend to get caught with large steel stocks if there is a strike.

Farmers Doing Better — Demand for farm equipment steel is fair—a seasonal slip had been expected. The farmers' position is good and is continuing to improve. Appliance steel needs are sluggish. But some types of appliances are moving well.

Galvanized sheet production will be close to capacity this month, reflecting strong demand for duct-

work (for air conditioning), culverts, and grain bins.

Tubular Goods . . .

Tubular Goods Prices, Page 109

A second large order for large diameter steel pipe will keep the Gadsden, Ala., plant of Republic Steel Corp. operating near capacity the remainder of the summer. The pipe, purchased by Southern Natural Gas Co., Birmingham, will be used in gas transmission lines in Louisiana, Mississippi, Alabama, and Georgia. The first large order (30-in. pipe) was placed earlier this year and is nearing completion.

Hedge buying helped tubular goods sales in June, but producers see no evidence of a solid improvement in market conditions. They're unable to say how much of the recent buying was due to price protection and how much was dictated by the need to replenish low inventories.

Standard pipe sales are better. Oil country goods shipments are expected to drop during July, reacting to June hedging. Increased drilling warrants some optimism though. Tubemakers say 2006 rigs are running, the largest number since March.

Laclede Steel's new pipe mill is producing continuous buttweld. Formerly, the company milled 20-ft lengths. It reports demand has been better in recent weeks due to hedge buying. It had to close its books about mid-June, but not many orders for July and August shipment have appeared.

Steel Bars . . .

Bar Prices, Page 105

June steel bar shipments were about 10 per cent above May's. The improvement largely reflected buyers' efforts to beat an expected July 1 price increase.

Demand has trailed that of other major products all year. Agricultural implement manufacturers are among the few consumers whose buying has come up to expectations.

Inventories are near bottom, as evidenced by increasing demands for prompt deliveries. But July business prospects are dulled by scheduled plant closings for vacations.

Except for government shops, arsenals and shipyards, third quarter bar inquiry is slow in New England. Watertown (Mass.) Arsenal is buying 1000 tons of hot-rolled squares for remelting; Springfield Armory is placing initial requirements for a new rifle and a forged chain shop; Boston Naval shipyard is taking 100 tons of 1⅜ in. diameter, hot rolled.

Commercial forge shops are placing little tonnage. Industrial demand through the third quarter will be slow.

With early deliveries still available, and requirements on the light side, commercial bar consumers (apart from a little hedge buying late last quarter) are covering their needs on what amounts to a spot basis. Buyers are still able to get carbon bars within a couple of weeks. The situation in cold drawn is equally easy.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 105

Demand for concrete reinforcing steel bars and highway mesh are at

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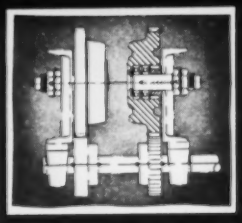

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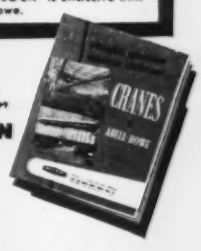

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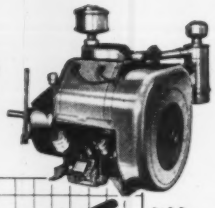
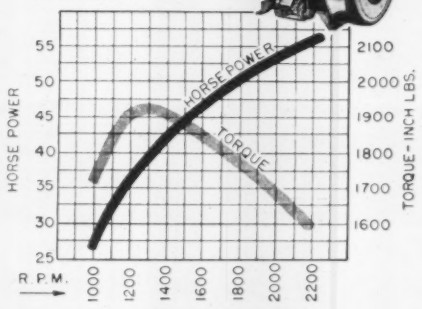


Model VR4D Wisconsin V-type, 4-cylinder, 56 hp. engine.



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A8-6124-1/A2

a high point for the year. While bridges account for the bulk of reinforcing bar volume in the East, schools and hospitals are calling for substantial tonnages.

Distribution of tonnage is somewhat uneven. A minority of fabricators refuse to meet some bid prices. Practically every bar tonnage to come out is bid on by numerous fabricators, the award usually going to the lowest bidder.

Wire . . .

Wire Prices, Pages 107 & 108

Most consumers who placed extra tonnage for July, and failed to get delivery before June 30 are retaining their position in mill schedules. The bulk of the orders is in the high carbon grades. Many users came into the market too late in June to get shipment before the end of the month, and their orders were not guaranteed price protection.

Merchant wire products and highway mesh are more active than the industrial grades. Wire rope is also moving at a fair rate, and prices on that product are more stable than they were.

Stainless Steel . . .

Stainless Steel Prices, Page 109

Stainless steel producers shipped more tonnage in June than in any previous month this year. One Pittsburgh maker's shipments were 15 per cent above the May level. Another's tonnage was 40 to 50 per cent better. Hedging figured importantly, as did inventory replenishment.

Plates . . .

Plate Prices, Page 105

Demand for steel plates is showing some improvement, with producers of welded pipe stepping up operations moderately.

Inquiries for small tanks and welded plate girder bridges are slightly heavier in the East. Some of the tonnage is required for enlarged storage tank capacity at Air Force bases in New England. Shipyards also are taking normal plate tonnage, and relatively small additional volume was placed for July shipment.

Plate fabricating shops, including those operated by warehouses, are 50 to 60 per cent engaged. New fabricating jobs are attracting more

estimates per job, and in most instances steel requirements are held up until fabricating awards are confirmed.

1957 Metallics Use Down

Final 1957 figures show consumption of scrap and pig iron totaled 149.9 million net tons, 3 per cent less than in 1956. The drop was the result of work stoppages and business recession in the last half of the year.

Scrap use was 73,548,823 net tons, vs. 80,315,170 the year before. Of the total, 56,764,655 tons were consumed in steel furnaces, vs. 62,276,019 in 1956; 15,647,960 in iron furnaces, vs. 16,698,026; 1,136,208 in miscellaneous, vs. 1,341,125.

Pig iron consumption was up about 2 per cent from the preceding year, amounting to 76,353,126 tons against 74,995,479 in 1956. Steel furnaces took 68,767,530 tons, vs. 66,437,573; iron furnaces, 7,585,596, vs. 8,557,906.

Alloy Steel . . .

Alloy steel shipments (other than stainless) totaled 232,064 net tons in April, of which 199,484 tons were full alloy and 32,580 high-strength low-alloy, reports the American Iron & Steel Institute. The comparable figures for April, 1957, were: Total, 426,594 tons; full alloy, 355,024; high-strength low alloy, 71,570.

In the first four months of this year, the movement amounted to 1,065,733 tons (924,188 full alloy and 141,545 high-strength low-alloy). Figures for the corresponding period of 1957: Total, 1,786,498 tons; full alloy, 1,497,981; high-strength low-alloy, 288,517.

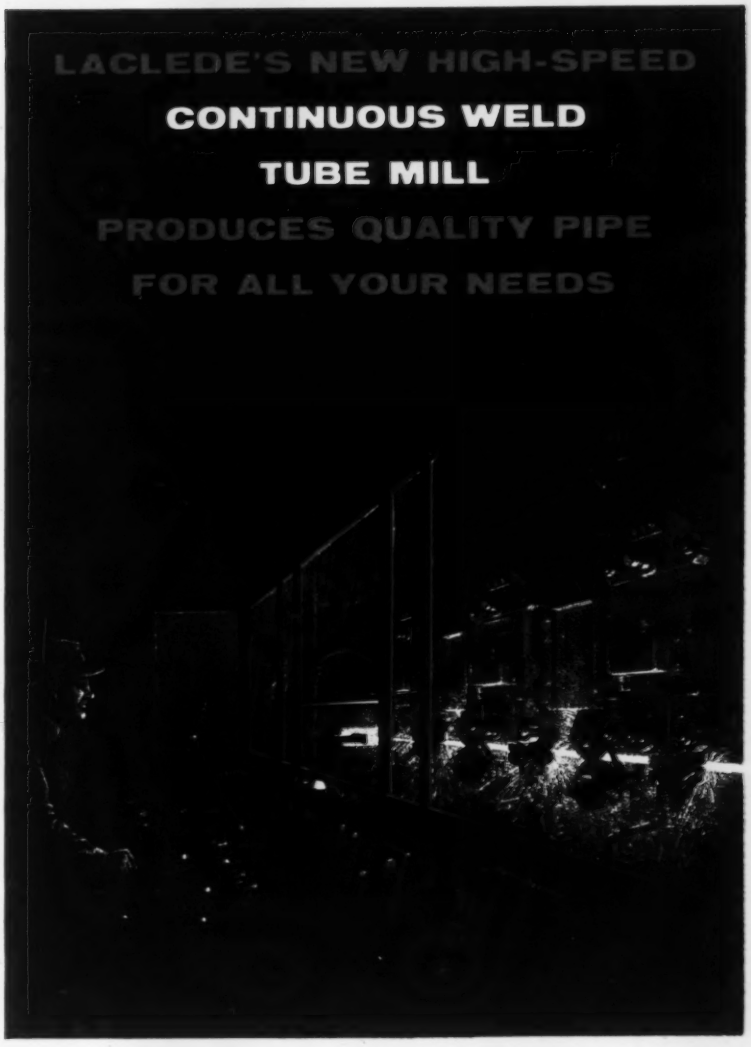
Warehouse . . .

Warehouse Prices, Page 110

Distributors in most sections of the country report a decline in bookings of steel products last week. A moderate improvement in June had brought volume for that month to a peak for the year. Inquiry was heaviest for alloys and specialties.

Buying is confined largely to inventory replacement. In the East, the bulk of activity has been in plates; structurals and bars have been slow.

In the Southwest, the high level



Continuous weld pipe, in sizes ½ inch through 4 inch and in lengths up to 60 feet, is now available from Laclede's new high-speed continuous weld tube mill.

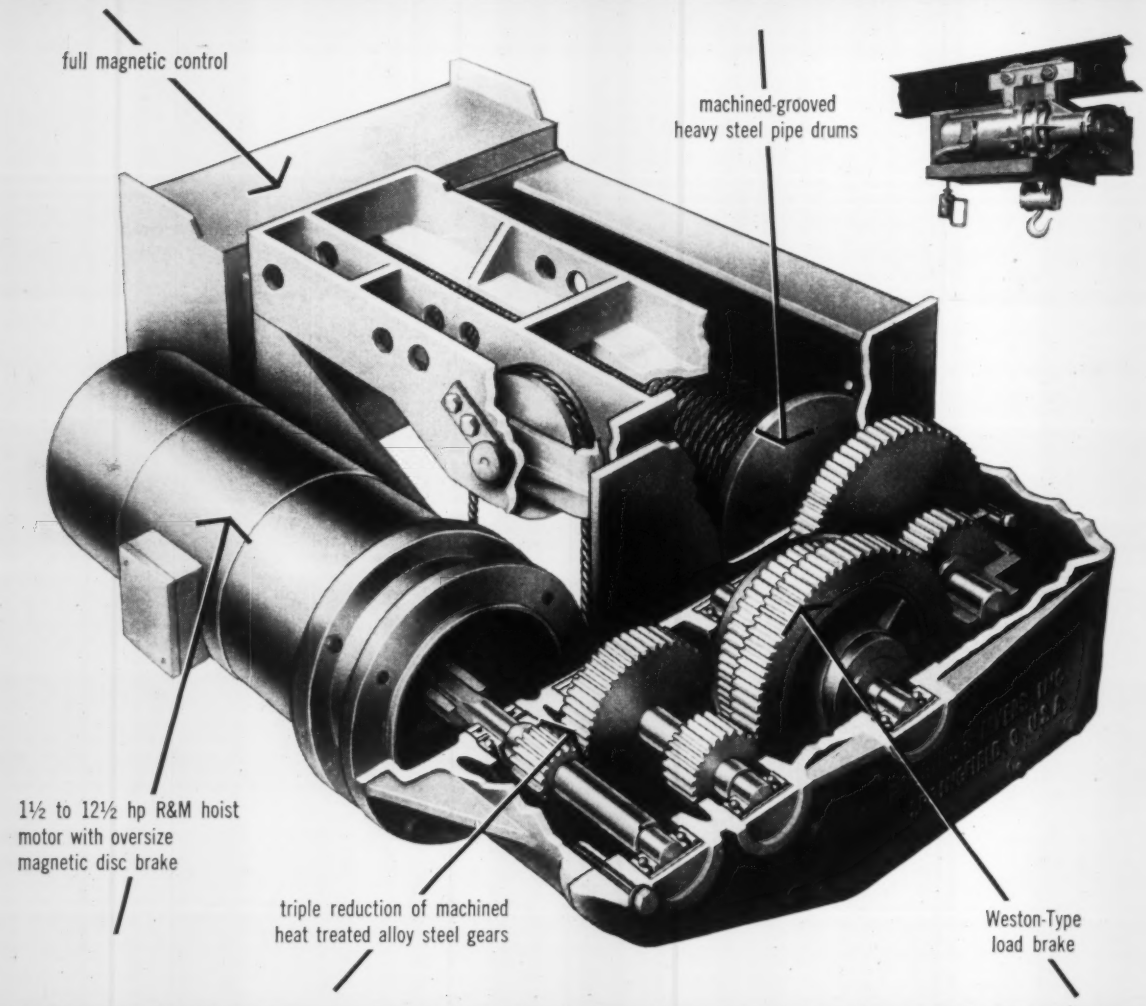
Made with uniform physical characteristics, pipe from Laclede's new mill is quality controlled . . . every step of the way . . . assuring quality tubing at its best.

LACLEDE STEEL COMPANY

Producers of Quality Steel for Construction and Industry

SAINT LOUIS 1, MISSOURI

big hoist value



R&M Type F standard low-headroom hoists excel in the heaviest, most severe service. Frame is solidly braced welded steel. Special weather and dustproof R&M hoist motor runs cool, has the highest time rating found in any standard hoist—30 min., 55° C. rise. And the oversize magnetic disc type motor brake requires virtually no adjustment. Full magnetic control with reduced push-button voltage is standard. With lug mounting, Type F-2 headroom is only 16½" in 2 ton capacity.

Capacities: ½ to 10 tons. Speeds: 10 to 54 fpm. Lug mounting; push, hand geared or motorized trolleys.

Robbins & Myers, Inc., Hoist & Crane Div., Springfield, O.

take it up with

ROBBINS & MYERS

hoists cranes

Request Bulletin 801-C today

of construction and roadbuilding has sustained bookings of warehouse steel. Although any advance in prices which may be posted by mills will be passed on to their customers, distributors in this territory face the pressure of low-priced foreign material.

Pig Iron . . .

Pig Iron Prices, Page 110

Pig iron shipments and sales hit a new low for the year last week because of the holiday and shutdowns at many foundries for mass vacations. Most sellers look for little improvement over the next several weeks; a few do not expect a marked pickup until early fall.

Sluggishness in merchant iron demand is traced to slow operations at the foundries which make castings for the railroads, machine tool builders, and the automotive industry.

Mystic Iron Works of Eastern Gas & Fuel Associates has banked its blast furnace at Everett, Mass. It will remain idle through July and part of August. Mystic has accumulated a substantial stockpile of iron and will make only light shipments the next two months.

Semifinished Steel . . .

Semifinished Prices, Page 105

The national ingot rate dropped 10 points last week to 53 per cent of capacity. The slump was caused by curtailments over the Fourth and suspensions for vacations. There'll be some recovery this week, but look for production to be pretty slow most of July.

Kaiser Steel employment at the Fontana (Calif.) Works will be reduced by 300, with open hearth operations on a six-furnace level. For the last several weeks, it has been operating eight furnaces, building up semifinished steel inventories.

Open hearth operations at the Worcester Works (Mass.) American Steel & Wire Div., U. S. Steel Corp., will end July 26. After that date, semifinished steel for the works (282,000 net tons of ingots annually) will be supplied by the Fairless Works, which, for some time has been supplying part of its billet requirements. The Worcester open hearths have been producing since 1889.

Rated annual steelmaking capacity of Granite City Steel Co., Granite City, Ill., will rise 120,000 tons to 1,320,000 July 1, reflecting partial completion of an expansion program started 2½ years ago. By the end of 1959, capacity will be 1,584,000—almost 47 per cent more than the 1,080,000 the company had at the start of its expansion in late 1955. When World War II ended, its capacity consisted of 290,000 tons in modern furnaces and 210,000 in small, high-cost furnaces that have since been razed.

Granite City has made changes in the design and firing of its open hearths. It is using larger charging boxes for loading scrap, and has enlarged its blast furnace production. In addition, a new generator will supply the open hearths with oxygen for flame enrichment and decarburization.

Cuts Rectifier Prices

Prices on silicon controlled rectifier preproduction samples have been cut 50 per cent by General Electric Co.'s Semiconductor Products Dept. The company cites increased output from its engineering development line. New prices on the nine medium power, developmental types available range from $50 each to $295 each.

The silicon controlled rectifier is a new ultralong life electronic component for automatic controls. It's about the same size, and is made of the same material, as a transistor. It is used to control the speed of motors, regulate light intensity, distribute electric current, and may be used in place of electrical relays and switches.

It is expected that, initially, controlled rectifiers will have wide use in industrial controls for regulating machines and processes. Eventually, they may be used in home appliances and lighting fixtures.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 111

Production of coke in April totaled 3,835,165 net tons (3,802,015 oven, and 33,150 beehive) reports the U. S. Bureau of Mines. In March, output was 4,343,326 tons (4,301,831 oven and 41,495 beehive), and in April a year ago it was 6,436,259 (6,221,182 oven and 215,077 beehive).

Producers' stocks of oven coke at the end of April amounted to 3,721,329 net tons, equal to 29.4 days' output. That compares with 3,478,465 tons (25.1 days) at the end of March, and 2,153,940 (10.4 days) at the end of April a year ago.

Structural Shapes . . .

Structural Shape Prices, Page 105

While vacation suspensions will be felt, construction steel requirements should hold at a brisk pace over the summer. In the East, early action is expected on 23,000 tons of shapes required for the House of Representatives office building in Washington. Bethlehem Steel Co. is low bidder.

Towers and bridges account for the bulk of 40,000 tons of structural steel actively before the market in New England. Wide flange beams required for bridges make up most of 5050 tons closing July 11 in Vermont. Requirements for Connecticut spans total 3500 tons.

The bridge erecting office of U. S. Steel's American Bridge Div. at Roanoke, Va., will be combined with that at the company's Birmingham plant.

New England fabricators did little price-hedge buying last month. Most estimates over the last two months do not mirror possible higher steel costs.

California has 209 miles of freeways under construction. Most of the state's 916 miles of expressways are designed for conversion to freeways. Bridge construction is active in the state, and competition is keen—the number of bidders per project is 7.7, vs. 5.3 in 1956.

No important structural steel projects are up for early bidding in the Pacific Northwest. Fabricators' backlogs are small, and competition for new tonnage is severe. Outside fabricators are seeking business in the district.

Midwestern fabricators are figuring on more inquiries, but competition is severe. Complaints of low profit margins are heard. But structural demand stands to improve moderately over coming weeks even though fabricators are still working down inventories. Wide flange sections are doing better than standard structurals.

American Bridge Div., U. S. Steel

Corp., is closing down its Gary (Ind.) plant for vacation July 14 to 28.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2200 tons, post office annex, Denver, for government, to Burkhardt Steel Co., Denver.

1120 tons, courthouse, Bucks County, Pennsylvania, to Frank M. Weaver & Co. Inc., Lansdale, Pa. This tonnage was erroneously reported placed with the Keystone Structural Steel Co., Trenton, N. J., in Steel, June 23.

400 tons, auditorium and chapel, Mercyknoll School, West Hartford, Conn., to City Iron Works, Hartford, Conn. (structurals), and Scherer Steel Co., Hartford (reinforcing); Wedhams & May Co., Hartford, general contractor.

380 tons, railroad overcrossing, state project, Portland, Oreg.; reported awarded to Portland Erection Co., Portland.

275 tons, two buildings, Shippensburg State Teachers College, to Crew Steel Co., York, Pa.

225 tons, boilerhouse extension, Semet-Solvay Div., Allied Chemical & Dye Corp., Harriett, N. Y., to Vierling Steel Works, Chicago.

209 tons, state bridge work, Dauphin and Lancaster counties, Pennsylvania, to Hi Welding Co.

200 tons, bridge project, FAS Route 945 No. S-886 (1), Alexander County, Illinois, for Illinois State Highway Commission, to Vierling Steel Works, Chicago.

195 tons, three span, composite I-beam and single I-beam bridge, St. Lawrence County, New York, to Gouverneur Iron Works; Putnam-Hawley Construction Co. Inc., Pottsdam, N. Y., general contractor; 60 tons of reinforcing bars went to the Bethlehem Steel Co., Bethlehem, Pa.

60 tons, Washington State highway project to Bethlehem Pacific Coast Steel Corp., Seattle; Pew Construction Co., general contractor.

STRUCTURAL STEEL PENDING

23,000 tons, House of Representatives office building, Washington; Bethlehem Steel Co., Bethlehem, Pa., is low bidder.

5070 tons, ten composite WF beam bridges, two 2-deck cantilever spans, and two composite WF approach spans, Brattleboro, Vt., bypass project; bids July 11, Montpelier, Vt.

780 tons, three-span welded girder bridge, Naugatuck River, Derby, Conn.; bids July 7, Hartford, Conn.

615 tons, four state bridges; also one pedestrian bridge and underpass; Waterbury Expressway, Hamilton Ave.-Scott Rd., Waterbury, Conn.; bids July 7, Hartford, Conn.

485 tons, four-span welded plate girder bridge, Farmington River, Bloomfield-East Granby, Conn.; bids July 7, Hartford, Conn.

445 tons, two I-beam bridges, Bangor, Maine; Seaboard Engineering Co. Inc., Portland, Maine, general contractor.

335 tons, two grade separation structures, relocation Route 9, Bloomfield-Simsbury, Conn.; bids July 7, Hartford, Conn.

150 tons, hangar and apron, Ft. Lewis, Wash.; general contract to Roy T. Earley Construction Co., Tacoma, Wash., low at $465,334.

115 tons, bridge, 151 ft, Bennington, Vt.; bids in.

110 tons, Town Farm Road bridge, Sidney, Maine; bids in.

REINFORCING BARS . . .

REINFORCING BARS PLACED

60,400 tons, two contracts for New York State Power Authority, both going to Bethlehem Steel Co., Bethlehem, Pa.; one contract, N6, Section 2, involved 35,700 tons, and the other, N7, Section 2, involved 24,700. Work is in connection with the St. Lawrence Seaway.

1100 tons, University properties office building and post office, Seattle, to Joseph T. Ryerson & Son Inc., Seattle, Lloyd Johnson & Morrison-Knudsen Co. Inc., Seattle, general contractor.

700 tons, main library, Seattle, to Soule Steel Co., Seattle; Lloyd Johnson & Morrison-Knudsen Co. Inc., contractor.

450 tons, library, Brandeis University, Waltham, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Lilly Construction Co., Boston, general contractor.

450 tons, office building, Fifth and Union, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Howard S. Wright & Co. Inc., Seattle, general contractor.

395 tons, junior high school, Lexington, Mass., to Northern Steel Inc., Boston; White Construction Co., Boston, general contractor.

300 tons, Washington State highway project, Kittitas County, to Soule Steel Co., Seattle; Quigg Bros.-McDonald Co., Hoquiam, Wash., general contractor.

195 tons, school addition, Ellensburg, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Roy T. Earley Construction Co., Tacoma, general contractor.

112 tons, Washington State highway project, Chelan County, to Bethlehem Pacific Coast Steel Corp., Seattle; Alton V. Phillips Co., Seattle, general contractor.

75 tons, Washington State bridge, Chehalis, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Troy Burnham, Seattle, general contractor.

REINFORCING BARS PENDING

465 tons, Amazon Creek flood control, Oregon State; J. W. Steinmuller, Eugene, Oreg., low bidder to U. S. Engineer, Portland, Oreg.

100 tons, plus miscellanous, Idaho State underpass, Bannock County; bids to Boise, Idaho, July 8.

65 tons, plus miscellaneous, 212-ft Idaho State underpass, Elmore County; bids to Boise, Idaho, July 15.

Unstated, 100-bed Grays Harbor Community Hospital, Hoquiam, Wash.; general contract to Cawdrey & Vemo, Seattle, $384,000.

Unstated, ammunition storage; Jensen, Rasmussen & Co., Sunnyside, Wash., and B-E-C-K Constructors, Seattle, joint low at $737,386, to U. S. Engineer, Walla Walla, Wash.

Unstated, maintenance and repair shop, Ft. Lewis, Wash., Cascade-Olympic Construction Co., Shelton, Wash., low at $871,258 to U. S. Engineer.

Unstated, missile, master installation, Ft. Lawton, Wash.; John H. Sellen Construction Co., Seattle, low at $1,511,617.

Unstated, first unit, Oregon State Dammasch Mental Hospital, near Wilsonville; Ross B. Hammond, Portland, Oreg., low at $6,043,142 to State Emergency Board.

Unstated, airmen's dormitory, Mountain Home, Idaho; Purvis Construction Co., Spokane, Wash., low at $482,804 to U. S. Engineer, Walla Walla, Wash.

Unstated, 432-ft and 450-ft bridges, Oregon state projects, Union County; Tom Lillebo, Reedsport, Oreg., is low at $509,819.

Unstated, Oregon state highway bids; Coos County, 443-ft span, Sig Anderson, Coos Bay, low at $128,156; Douglas County, 204-ft span, Tom Lillebo, Reedsport, Oreg., low at $105,905.

PLATES . . .

PLATES PLACED

250 tons, sheet piling, Washington State bridge, Chelan County, to Bethlehem Pacific Coast Steel Corp., Seattle; Alton V. Phillips Co., Seattle, general contractor.

PLATES PENDING

450 tons, tanks, jet fuel storage, AFB, Kansasville, Wis.; bids July 23, U. S. Engineer.

PIPE . . .

CAST IRON PIPE PLACED

114 tons, 12 and 16 in. for Alderwood Manor, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

92 tons, 16-in. line, for Auburn, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

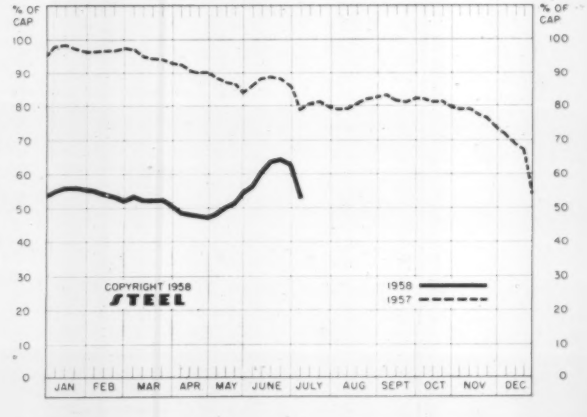
	Week Ended July 6	Change	Same 1957	Week 1956
Pittsburgh	51.5	— 7.5	83	2.5
Chicago	57.5	— 9.5*	86	6
Mid-Atlantic	56	— 6	89	9
Youngstown	25	—24	68.5	5
Wheeling	68.5	— 1.5	72	56
Cleveland	25.5	—24.5	80.5	0
Buffalo	41.5	— 2.5	85.5	0
Birmingham	66.5	— 1.5	92.5	2.5
New England	39	0	0	10
Cincinnati	63.5	— 2.5*	77.5	69.5
St. Louis	85	— 0.5	80.5	93.5
Detroit	57	— 9.5*	112	15.5
Western	70	— 4	100	33
National Rate	53	—10	78.5	14

INGOT PRODUCTION‡

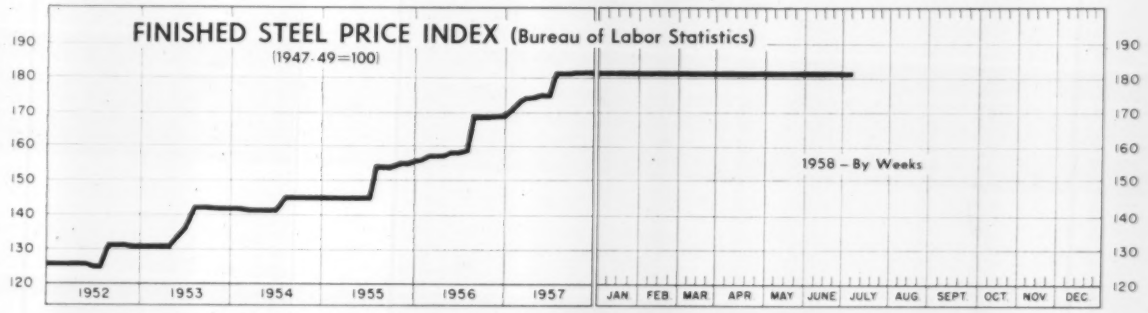
	Week Ended July 6	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	88.6†	103.7	104.9	125.1
NET TONS (In thousands)	1,423†	1,666	1,685	2,009

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



July 1, 1958	Week Ago	Month Ago	June Avg	Year Ago
181.5†	181.5	181.6	181.5	180.7

†Preliminary.

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 1

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600
Rails, Light, 40 lb	7.067
Tie Plates	6.600
Axles, Railway	9.825
Wheels, Freight Car, 33 in. (per wheel)	60.000
Plates, Carbon	6.150
Structural Shapes	5.942
Bars, Tool Steel, Carbon (lb)	0.535
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850
Bars, H.R., Alloy	10.525
Bars, H.R., Stainless, 303 (lb)	0.525
Bars, H.R., Carbon	6.425
Bars, Reinforcing	6.135
Bars, C.F., Carbon	10.360
Bars, C.F., Alloy	13.875
Bars, C.F., Stainless, 302 (lb)	0.553
Sheets, H. R., Carbon	6.175
Sheets, C.R., Carbon	7.075
Sheets, Galvanized	8.270
Sheets, C.R., Stainless, 302 (lb)	0.688
Sheets, Electrical	12.025
Strip, C.R., Carbon	9.214
Strip, C.R., Stainless, 430 (lb)	0.493
Strip, H.R., Carbon	6.075
Pipe, Black, Buttweld (100 ft)	19.814
Pipe, Galv., Buttweld (100 ft)	23.264
Pipe, Line (100 ft)	199.023
Casing, Oil Well, Carbon (100 ft)	194.499
Casing, Oil Well, Alloy (100 ft)	304.610
Tubes, Boiler (100 ft)	49.130
Tubing, Mechanical, Carbon (100 ft)	24.953
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
Black Plate, Canmaking Quality (95 lb base box)	7.583
Wire, Drawn, Carbon	10.225
Wire, Drawn, Stainless, 430 (lb)	0.653
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.828
Wire, Barbed (80-rod spool)	8.719
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 2 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	239.15	189.18
Index in cents per lb	6.479	6.479	6.479	6.479	5.125

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$145.74	$114.53
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	64.70	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	64.23	56.00
Malleable Pig Iron, GT	67.27	67.27	67.27	65.77	57.27
Steelmaking Scrap, GT	35.67	35.00	36.17	55.33	43.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	July 2 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.425	4.15
Bars, H.R., Chicago	5.425	5.425	5.425	5.425	4.15
Bars, H.R., deld. Philadelphia	5.725	5.725	5.725	5.715	5.302
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	7.30*	5.20
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.275	4.10
Shapes, Std., Chicago	5.275	5.275	5.275	5.275	4.10
Shapes, deld. Philadelphia	5.545	5.545	5.545	5.585	4.38
Plates, Pittsburgh	5.10	5.10	5.10	5.10	4.10
Plates, Chicago	5.10	5.10	5.10	5.10	4.10
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.50	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	5.10	4.10
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.55
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.925
Sheets, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Chicago	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Detroit	6.05	6.05	6.05-6.15	5.75-5.85	4.975
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.60	5.275
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.975-4.425
Strip, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Strip, C.R., Pittsburgh	7.15	7.15	7.15	7.15	5.45-5.95
Strip, C.R., Chicago	7.15	7.15	7.15	7.15	5.70
Strip, C.R., Detroit	7.15	7.15	7.25	6.95	5.45-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.65	5.475-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.35-6.55
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$75.50
Wire rods $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.15	6.15	6.15	5.80	4.525

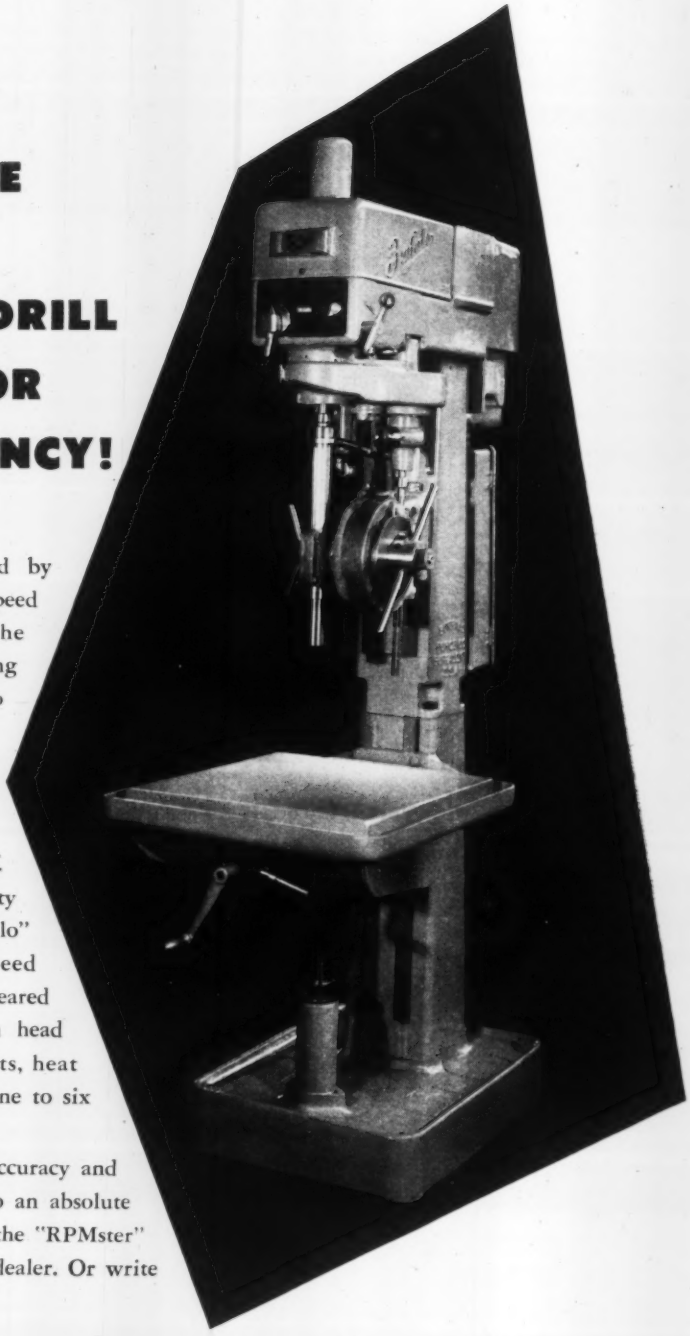
PIG IRON, Gross Ton	July 2 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$65.50	$57.00
Basic, Valley	66.00	66.00	66.00	64.50	56.00
Basic, deld., Phila.	70.41	70.41	70.41	68.38	60.75
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	65.00	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	65.00	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	68.88	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	60.43
Malleable, Valley	66.50	66.50	66.50	65.00	56.50
Malleable, Chicago	66.50	66.50	66.50	65.00	56.50
Ferromanganese, net ton	245.00†	245.00†	245.00†	255.00†	200.00*

†74-76% Mn, Duquesne, Pa. *Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$35.50	$35.50	$36.50	$56.50	$44.50
No. 1 Heavy Melt, E. Pa.	34.00	34.00	34.50	56.00	43.50
No. 1 Heavy Melt, Chicago	37.50	35.50	37.50	53.50	41.50
No. 1 Heavy Melt, Valley	36.50	36.50	36.50	54.50	45.50
No. 1 Heavy Melt, Cleve.	33.00	33.00	33.00	51.50	43.50
No. 1 Heavy Melt, Buffalo	26.50	26.50	26.50	46.50	40.75
Rails, Rerolling, Chicago	55.50	52.50	56.50	74.50	50.00
No. 1 Cast, Chicago	41.50	39.50	41.50	47.50	40.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.00	17.00

EVERY FEATURE OF THIS VARIABLE SPEED DRILL IS DESIGNED FOR OPERATOR EFFICIENCY!



Painstakingly engineered and handcrafted by "Buffalo" to create the finest variable speed drilling machine that money can buy, the "RPMster" sets a new standard of drilling ease and smoothness that's certain to increase the efficiency and output of your operators. A touch of the easily-reached controls on the head gives the operator instant and infinite speed changes ranging from 100 to 3000 RPM. Contributing to the accuracy, dependability and trouble-free long life of the "Buffalo" "RPMster" are the gearless variable speed drive — precision spindle — reliable, all-geared power feed — hand-scraped ways on both head and table — finest alloy steel components, heat treated prior to machining. Available in one to six spindle models, with tapping attachments.

For a totally new experience in drilling accuracy and operational ease, with vibration reduced to an absolute minimum, arrange for a demonstration of the "RPMster" with your nearby "Buffalo" machine tool dealer. Or write direct for Bulletin 3967-A.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

158 MORTIMER STREET • BUFFALO, N. Y.

Canadian Blower & Forge Co. Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

Steel Prices

Mill prices as reported to STEEL, July 2, cents per pound except as otherwise noted. *Change shown in italics.* Code numbers following mill points indicate producing company. Key to producers, Page 106; footnotes, Page 108.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 $73.50

INGOTS, Alloy (NT)
Detroit S41 $77.00
Farrell,Pa. S3 77.00
Lowellville, O. S3 77.00
Midland,Pa. C18 77.00
Munhall,Pa. U5 77.00
Sharon,Pa. S3 77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 $77.50
Buffalo R2 77.50
Clairton,Pa. U5 77.50
Ensley,Ala. T2 77.50
Fairfield,Ala. T2 77.50
Fontana,Calif. K1 88.00
Gary, Ind. U5 77.50
Johnstown,Pa. B3 77.50
Lackawanna,N.Y. B2 77.50
Munhall, Pa. U5 77.50
Owensboro,Ky. G8 77.50
S.Chicago,Ill. R2, U5 77.50
S. Duquesne,Pa. U5 77.50
Sterling,Ill. N15 77.50
Youngstown R2 77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 $96.00
Buffalo R2 96.00
Canton,O. R2 98.50
Clairton,Pa. U5 96.00
Conshohocken,Pa. A3 101.00
Ensley,Ala. T2 96.00
Fairfield,Ala. T2 96.00
Fontana,Calif. K1 105.50
Gary,Ind. U5 96.00
Geneva, Utah C11 96.00
Houston S5 101.00
Johnstown,Pa. B2 96.00
Lackawanna,N.Y. B2 96.00
Los Angeles B3 105.50
Midland,Pa. C18 96.00
Munhall,Pa. U5 96.00
Owensboro,Ky. G8 96.00
Seattle B3 109.50
Sharon,Pa. S3 96.00
S.Chicago R2, U5, W14 96.00
S.Duquesne,Pa. U5 96.00
S.SanFrancisco B3 105.50
Warren,O. C17 96.00

Alloy, forging (NT)
Bethlehem,Pa. B2 $114.00
Bridgeport,Conn. C32 114.00
Buffalo R2 114.00
Canton,O. R2, T7 114.00
Conshohocken,Pa. A3 121.00
Detroit S41 114.00
Economy,Pa. B14 114.00
Farrell,Pa. S3 114.00
Fontana,Calif. K1 135.00
Gary,Ind. U5 114.00
Houston S5 119.00
Ind.Harbor,Ind. Y1 114.00
Johnstown,Pa. B2 114.00
Lackawanna,N.Y. B2 114.00
LosAngeles B3 131.00
Lowellville,O. S3 114.00
Massillon,O. R2 114.00
Midland,Pa. C18 114.00
Munhall,Pa. U5 114.00
Owensboro,Ky. G8 114.00
Sharon,Pa. S3 114.00
S.Chicago R2,U5,W14 114.00
S.Duquesne,Pa. U5 114.00
Struthers,O. Y1 114.00
Warren,O. C17 114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 $117.50
Canton,O. R2 120.00
Cleveland R2 117.50
Gary,Ind U5 117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 117.50
Warren,O. C17 117.50

SKELP
Aliquippa,Pa. J5 5.075
Munhall,Pa. U5 4.875
Pittsburgh J5 5.075
Warren,O. R2 4.875
Youngstown R2, U5 4.875

WIRE RODS
AlabamaCity,Ala. R2 6.15
Aliquippa,Pa. J5 6.15
Alton,Ill. L1 6.35
Buffalo W12 6.15
Cleveland A7 6.15
Donora,Pa. A7 6.15
Fairfield,Ala. T2 6.15
Houston S5 6.40
IndianaHarbor,Ind. Y1 6.15
Johnstown,Pa. B2 6.15
Joliet,Ill. A7 6.15
KansasCity,Mo. S5 6.40
Kokomo,Ind. C16 6.25
LosAngeles B3 6.95
Minnequa,Colo. C10 6.40
Monessen,Pa. P7 6.15
N.Tonawanda,N.Y. B11 6.15
Pittsburg,Calif. C11 6.95
Portsmouth,O. P12 6.15
Roebling,N.J. R5 6.25
S.Chicago,Ill. R2 6.15
SparrowsPoint,Md. B2 6.25
Sterling,Ill. (1) N15 6.15
Sterling,Ill. N15 6.25
Struthers,O. Y1 6.15
Worcester,Mass. A7 6.45

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 5.275
Atlanta A11 5.475
Aliquippa,Pa. J5 5.275
Bessemer,Ala. T2 5.275
Bethlehem,Pa. B2 5.325
Birmingham C15 5.275
Clairton,Pa. U5 5.275
Fairfield,Ala. T2 5.275
Fontana,Calif. K1 6.075
Gary,Ind. U5 5.275
Geneva,Utah C11 5.275
Houston S5 5.275
Ind.Harbor,Ind. I-2 5.275
Johnstown,Pa. B2 5.325
Joliet,Ill. P22 5.275
KansasCity,Mo. S5 5.375
Lackawanna,N.Y. B2 5.325
LosAngeles B3 5.975
Minnequa,Colo. C10 5.575
Munhall,Pa. U5 5.275
Niles,Calif. P1 5.925
Phoenixville,Pa. P4 5.325
Portland,Oreg. O4 6.025
Seattle B3 6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 5.925
Sterling,Ill. N15 5.275
Torrance,Calif. C11 5.975
Weirton,W.Va. W6 5.275

Wide Flange
Bethlehem,Pa. B2 5.325
Clairton,Pa. U5 5.275
Fontana,Calif. K1 6.225
IndianaHarbor,Ind. I-2 5.275
Lackawanna,N.Y. B2 5.325
Munhall,Pa. U5 5.275
Phoenixville,Pa. P4 5.325
S.Chicago,Ill. U5 5.275
Weirton,W.Va. W6 5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 6.55
Clairton,Pa. U5 6.55
Gary,Ind. U5 6.55
Houston S5 6.65
KansasCity,Mo. S5 6.65
Munhall,Pa. U5 6.55
S.Chicago,Ill. U5 6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 7.75
Bessemer,Ala. T2 7.75
Bethlehem,Pa. B2 7.80
Clairton,Pa. U5 7.75
Fairfield,Ala. T2 7.75
Fontana,Calif. K1 8.55
Gary,Ind. U5 7.75
Geneva,Utah C11 7.75
Houston S5 7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 7.80
KansasCity,Mo. S5 7.85
Lackawanna,N.Y. B2 7.80
LosAngeles B3 8.45
Munhall,Pa. U5 7.75
Seattle B3 8.50
S.Chicago,Ill. U5, W14 7.75
S.SanFrancisco B3 8.40
Struthers,O. Y1 7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 7.80
Lackawanna,N.Y. B2 7.80
Munhall,Pa. U5 7.75
S.Chicago,Ill. U5 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 5.325
Lackawanna,N.Y. B2 5.325
Munhall,Pa. U5 5.275
S.Chicago,Ill. U5 5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 6.225
Munhall,Pa. U5 6.225
S.Chicago,Ill. U5 6.225
Weirton,W.Va. W6 6.225

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 5.10
Aliquippa,Pa. J5 5.10
Ashland,Ky.(15) A10 5.10
Atlanta A11 5.30
Bessemer,Ala. T2 5.10
Clairton,Pa. U5 5.10
Claymont,Del. C22 5.10
Cleveland J5, R2 5.20
Coatesville,Pa. L7 5.10
Conshohocken,Pa. A3 5.10
Ecorse, Mich. G5 5.10
Fairfield,Ala. T2 5.10
Fontana,Calif.(30) K1 5.90
Gary,Ind. U5 5.10
Geneva,Utah C11 5.10
GraniteCity,Ill. G4 5.20
Harrisburg,Pa. P4 5.10
Houston S5 5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa. B2 5.10
Lackawanna,N.Y. B2 5.10
LoneStar,Tex. L6 5.20
Mansfield,O. E6 5.10
Minnequa,Colo. C10 5.95
Munhall,Pa. U5 5.10
Newport,Ky. A2 5.10
Pittsburgh J5 5.10
Riverdale,Ill. A1 5.10
Seattle B3 6.00
Sharon,Pa. S3 5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 5.10
Sterling,Ill. N15 5.10
Steubenville,O. W10 5.10
Warren,O. R2 5.10
Youngstown U5, Y1 5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 6.75
Fontana,Calif. K1 7.55
Geneva,Utah C11 6.75
Houston S5 6.85
Johnstown,Pa. B2 6.75
SparrowsPoint,Md. B2 6.75

PLATES, Wrought Iron
Economy,Pa. B14 13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 7.625
Bessemer,Ala. T2 7.625
Clairton,Pa. U5 7.625
Claymont,Del. C22 7.625
Cleveland J5, R2 7.625
Coatesville,Pa. L7 7.625
Conshohocken,Pa. A3 7.625
Economy,Pa. B14 7.625
Ecorse,Mich. G5 7.625
Fairfield,Ala. T2 7.625
Farrell,Pa. S3 7.625
Fontana,Calif.(30) K1 8.425
Gary,Ind. U5 7.625
Geneva,Utah C11 7.625
Houston S5 7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 7.625
Munhall,Pa. U5 7.625
Pittsburgh J5 7.625
Seattle B3 8.525
Sharon,Pa. S3 7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2 7.625
Warren,O. R2 7.625
Youngstown U5 7.625

PLATES, ALLOY
Aliquippa,Pa. J5 7.20
Claymont,Del. C22 7.20
Coatesville,Pa. L7 7.20
Economy,Pa. B14 7.20
Fontana,Calif K1 8.00
Gary,Ind. U5 7.20
Houston S5 7.30
Ind.Harbor,Ind. Y1 7.20
Johnstown,Pa. B2 7.20
Lowellville,O. S3 7.20
Munhall,Pa. U5 7.20
Newport,Ky. A2 7.20
Pittsburgh J5 7.20
Seattle B3 8.10
Sharon,Pa. S3 7.20
S.Chicago,Ill. U5, W14 7.20
SparrowsPoint,Md. B2 7.20
Youngstown Y1 7.20

FLOOR PLATES
Cleveland J5 6.175
Conshohocken,Pa. A3 6.175
Ind.Harbor, Ind. I-2 6.175
Munhall,Pa. U5 6.175
S.Chicago,Ill. U5 6.175

PLATES, Ingot Iron
Ashland c.l.(15) A10 5.35
Ashland l.c.l.(15) A10 5.85
Cleveland c.l. R2 5.85
Warren,O. c.. R2 5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 5.425
Aliquippa,Pa.(9) J5 5.425
Alton,Ill. L1 5.625
Atlanta(9) A11 5.625
Bessemer,Ala.(9) T2 5.425
Birmingham(9) C15 5.425
Buffalo(9) R2 5.425
Clairton,Pa.(9) U5 5.425
Cleveland (9) R2 5.425
Ecorse,Mich.(9) G5 5.425
Emeryville,Calif. J7 6.175
Fairfield,Ala.(9) T2 5.425
Fairless,Pa.(9) U5 5.575
Fontana,Calif.(9) K1 6.125
Gary,Ind.(9) U5 5.425
Houston(9) S5 5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 5.425
Joliet,Ill. P22 5.425
KansasCity,Mo.(9) S5 6.675
Lackawanna(9) B2 5.425
LosAngeles(9) B3 6.125
Midland,Pa.(23) C18 5.725
Milton,Pa. M18 5.575
Minnequa,Colo. C10 5.875
Niles,Calif. P1 6.125
N.Tonawanda,N.Y.(23)B11 5.775
Owensboro,Ky.(9) G8 5.425
Pittsburg,Calif.(9) C11 6.125
Pittsburgh(9) J5 5.425
Portland,Oreg. O4 6.175
Seattle B3, N14 6.175
S.Ch'c'go(3)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15 5.425
Sterling,Ill.(9) N15 5.525
Struthers,O.(9) Y1 5.425
Tonawanda,N.Y. B12 5.425
Torrance,Calif.(9) C11 6.125
Youngstown(9)R2, U5 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 6.475
Bethlehem,Pa. B2 6.475
Bridgeport,Conn. C32 6.55
Buffalo R2 6.475
Canton,O. R2, T7 6.475
Clairton,Pa. U5 6.475
Detroit S41 6.475
Economy,Pa. B14 6.475
Ecorse,Mich. G5 6.475
Fairless Pa. U5 6.625
Farrell,Pa. S3 6.475
Fontana,Calif. K1 7.525
Gary,Ind. U5 6.475
Houston S5 6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 6.475
KansasCity,Mo. S5 6.725
Lackawanna,N.Y. B2 6.475
Lowellville,O. S3 6.475
LosAngeles B3 7.525
Massillon,O. R2 6.475
Midland,Pa. C18 6.475
Owensboro,Ky. G8 6.475
Pittsburgh J5 6.475
Sharon,Pa. S3 6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 6.475
Struthers,O. Y1 6.475
Warren,O. C17 6.475
Youngstown U5 6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 7.925
Bessemer,Ala. T2 7.925
Bethlehem,Pa. B2 7.925
Clairton,Pa. U5 7.925
Cleveland R2 7.925
Ecorse,Mich. G5 7.925
Fairfield,Ala. T2 7.925
Fontana,Calif. K1 8.625
Gary,Ind. U5 7.925
Houston S5 8.175
Ind.Harbor,Ind. Y1 7.925
Johnstown,Pa. B2 7.925
KansasCity,Mo. S5 8.175
Lackawanna,N.Y. B2 7.925
LosAngeles B3 8.625
Pittsburgh J5 7.925
Seattle B3 8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 7.925
S.SanFrancisco B3 8.675
Struthers,O. Y1 7.925
Youngstown U5 7.925

BAR SIZE ANGLE; H.R. Carbon
Bethlehem,Pa.(9) B2 5.575
Houston(9) S5 5.675
KansasCity,Mo.(9) S5 5.675
Lackawanna(9) B2 5.425
Sterling,Ill. N15 5.525
Sterling,Ill.(1) N15 5.425
Tonawanda,N.Y. B12 5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 5.425
Atlanta A11 5.625
Joliet,Ill. P22 5.425
Niles,Calif. P1 6.125
Pittsburgh J5 5.425
Portland,Oreg. O4 6.175
SanFrancisco S7 6.275
Seattle B3 6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 6.55
Clairton,Pa. U5 6.55
Gary,Ind. U5 6.55
Houston S5 6.80
KansasCity,Mo. S5 6.80
Pittsburgh J5 6.55
Youngstown U5 6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 9.925
BeaverFalls,Pa. M12 9.925
Camden,N.J. P13 10.10
Chicago W18 9.925
Cleveland C20 9.925*
Elyria O. W8 9.925
LosAngeles P2, S30 11.40*
Monaca,Pa. S17 9.925
Newark,N.J. W18 10.10
SpringCity,Pa. K3 10.10
Warren,O. C17 9.925

*Grade A; add 0.50c for Grade B

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 7.90
Buffalo B5 7.35
Camden,N.J. P13 7.75
Carnegie,Pa. C12 7.30
Chicago W18 7.30
Cleveland A7, C20 7.30
Detroit B5, P17 7.50
Detroit S41 7.30
Donora,Pa. A7 7.30
Elyria,O. W8 7.30
FranklinPark,Ill. N5 7.30
Gary,Ind. R2 7.30
GreenBay,Wis. F7 7.30
Hammond,Ind. J5, L2 7.30
Hartford,Conn. R2 7.80
Harvey,Ill. B5 7.30
LosAngeles(49) S30 8.75
LosAngeles P2 R2 8.75
Mansfield,Mass. B5 7.85
Massillon,O. R2 R8 7.30
Midland,Pa. C18 7.30
Monaca,Pa. S17 7.30
Newark,N.J. W18 7.75
NewCastle,Pa.(17) B4 7.30
Pittsburgh J5 7.30
Plymouth,Mich. P5 7.55
Putnam,Conn. W18 7.85
Readville,Mass. C14 7.85
S.Chicago,Ill. W14 7.30
SpringCity,Pa. K3 7.75
Struthers,O. Y1 7.30
Warren,O. C17 7.30
Willimantic,Conn. J5 7.80
Waukegan,Ill. A7 7.30
Youngstown F3, Y1 7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 8.775
Bridgeport,Conn. C32 8.925
Buffalo B5 8.775
Camden,N.J. P13 8.95
Canton,O. T7 8.775
Carnegie,Pa. C12 8.775
Chicago W18 8.775
Cleveland A7, C20 8.775
Detroit B5, P17 8.975
Detroit S41 8.775
Donora,Pa. A7 8.775
Elyria,O. W8 8.775
FranklinPark,Ill. N5 8.775
Gary,Ind. R2 8.775
GreenBay, Wis. F7 8.775
Hammond,Ind. J5, L2 8.775
Hartford,Conn. R2 9.075
Harvey,Ill. B5 8.775
Lackawanna,N.Y. B2 8.775
LosAngeles P2, S30 10.75
Mansfield,Mass. B5 9.075
Massillon,O. R2, R8 8.775
Midland,Pa. C18 8.775
Monaca,Pa. S17 8.775
Newark,N.J. W18 8.95
Plymouth,Mich. P5 8.975
S.Chicago,Ill. W14 8.775
SpringCity,Pa. K3 8.95
Struthers,O. Y1 8.775
Warren,O. C17 8.775
Waukegan,Ill. A7 8.775
Willimantic,Conn. J5 9.075
Worcester,Mass. A7 9.075
Youngstown F3, Y1 8.775

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.425
Atlanta A11 .....5.425
Birmingham C15 .....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ....6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 .....6.125
Ft.Worth,Tex.(4)(26)T45.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 .....5.675
Kokomo,Ind. C16 .....5.525
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPointMd. B2 ..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2, U8 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Houston S5 .....7.35
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P1 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts. (4)(44) I-2 5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 ....5.325
Tonawanda(3) B12 ..5.325
Tonawanda(4) B12 ...6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....4.925
Ecorse,Mich. G5 .....4.925
Fairfield,Ala. T2 ....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill.(8) G4 5.025
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ...4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill W14 ....4.925
SparrowsPoint,Md. B2 4.925
Steubenville,O. W10 ....4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ...4.925

SHEETS, H.R. (19) Ga. & Lighter

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 .....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.275
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.05
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ....6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.15
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled, High-Strength, Low Alloy

Cleveland J5, R2 .....8.975
Ecorse,Mich G5 .....8.975
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ..10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2..8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.05	...
Ind.Harbor I-2	..6.95	7.20
Irvin,Pa. U5	....6.95	7.20
Kokomo,Ind. C16	.7.05	...
MartinsFry. W10	6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.20

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 ..6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. E6 .....6.60‡
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60†
GraniteCity,Ill. G4 ....6.70*
Ind.Harbor,Ind. I-2 ....6.60†
Irvin,Pa. U5 .....6.60†
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.425
Niles,O.(28) R2 .....7.425
Youngstown J5 .....7.275
Weirton,W.Va. W6 ....7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.25
Butler,Pa. A10 (type 2) 9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Fairfield,Ala. T2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.725
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 ....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, R2, S3 ..7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	4.925
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	4.925
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.Chicago W14	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2, S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.325
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Dearborn,Mich. D3	7.15
Detroit D2, M1, P20	7.15
Dover,O. G6	7.15
Ecorse,Mich. G5	7.15
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain,Conn. S15	7.60
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.50
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45
Weirton,W.Va. W6	10.50
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
New York W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.725*	10.95*	11.65*	12.75*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10	....	11.35†	12.05	13.15	14.20
					Stator
Vandergrift,Pa. U5	....	....	....	....	7.85

H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	15.25††
Butler,Pa. A10	....	....	....	19.20	19.70	20.20
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower. ††Coils only.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.65
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.85
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.60
Worcester,Mass. A7, J4, T6	9.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.60
Worcester A7, J4, T6	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE	(A)
Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
St.Louis L8	12.75
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. MS	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. MS	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. MS	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7 ....$9.10

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. MS	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Houston S5	180
Jacksonville,Fla. MS	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. MS	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. MS	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. MS	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. MS	10.70
Johnstown Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. MS	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. MS	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. MS	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. MS	214
Joliet,Ill. A7	214
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	172
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	172
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. MS	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	193**
Jacksonville,Fla. MS	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	192**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198§†

WOVEN FENCE, 9-15 Ga.	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. MS	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. MS	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Craw'dsville MS	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	17.40	18.95**
Jacksonville MS.	17.25	19.05
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass.W2	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05††
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	18.65	19.20**
Aliquippa J5	18.65	19.325§
Atlanta(48) A11	18.75	19.425*
Bartonville(48) K4	18.75	19.425
Buffalo W12	18.65	19.20†
Cleveland A7	18.65	....
Crawfordsville MS	18.75	19.425
Donora,Pa. A7	18.65	19.20†
Duluth A7	18.65	19.20†
Fairfield T2	18.65	19.20†
Houston(48) S5	18.90	19.45**
Jacks'ville,Fla. MS	18.75	19.425
Johnstown B2(48)	18.65	19.325§
Joliet,Ill. A7	18.65	19.20†
Kans.City(48) S5	18.90	19.45**
Kokomo C16	18.75	19.30†
LosAngeles B3	19.60	10.275§
Minnequa C10	18.90	19.45**
Monessen P7(48)	18.65	19.325§
Palmer,Mass. W12	18.95	19.50†
Pitts.Calif. C11	19.60	10.15†
Rankin,Pa. A7	18.65	19.20†
S.Chicago R2	18.65	19.20**
S.SanFran. C10	19.60	10.15**
Spar'wsPt.B2(48)	18.75	19.425§
Sterling(48) N15	18.90	19.575††
Sterling(1) (48)	18.80	19.475††
Struthers,O. Y1	18.65	19.30‡
Worcester,Mass.A7	18.95	19.50†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	49.0
Longer than 6 in.	39.0
⅝ in. thru 1 in.:	
6 in. and shorter	39.0
Longer than 6 in.	35.0
1¼ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	49.0
Carriage, Machine, Lag Bolts Hot Galvanized:	
½ in. and smaller:	
6 in. and shorter	29.0
Longer than 6 in.	15.0
⅝ in. and larger:	
All lengths	12.0
Lag Bolts (all diam.)	
6 in. and shorter	49.0
Longer than 6 in.	39.0
Plow and Tap Bolts	
½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or longer than 6 in.	39.0
Blank Bolts	39.0
Step, Elevator, Tire Bolts	49.0
Stove Bolts, Slotted:	
¼ to ¾ in. incl., 3 in. and shorter	55.0
⅞ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:	
All sizes	55.5
Square Nuts, Reg. & Heavy, Hot Galvanized:	
All sizes	41.0
Hex Nuts, Reg. & Heavy, Hot Pressed:	
¾ in. and smaller	60.5
⅞ in. to 1 in., incl.	55.5
1¼ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5
Hex Nuts, Reg. & Heavy, Cold Punched:	
¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5
Hex Nuts, All Types, Hot Galvanized:	
¾ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1¼ in. to 1½ in., incl.	46.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):	
¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5
Hex Nuts, Finished (Incl. Slotted and Castellated):	
1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):	
⅝ in. and smaller	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:	
6 in. and shorter:	
⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+ 6.0
High Carbon, Heat Treated:	
6 in. and shorter:	
⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller	+13.0
¾, ⅞, and 1 in. diam.	+32.0
Flat Head Capscrews:	
¾ in. and smaller	+ 76.0
Setscrews, Square Head, Cup Point, Coarse Thread:	
Through 1 in. diam.:	
6 in. and shorter	Net
Longer than 6 in.	+ 23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

1/16 in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60-lb Under
Rails				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....	(16)6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor, Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. Base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points higher.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6.7 Ga.
(49) 3½ in. and smaller rounds; 9.50c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	—Rerolling— Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	95.25	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	35.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.00	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	42.00
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	39.75
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.50	49.50	54.50	58.25
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.00	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Strip, Carbon Base —Cold Rolled— Both Sides
Copper*	33.10	38.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.285
18.25	4.25	1	4.75	....	2.500
18	4	2	9	....	2.870
18	4	2	....	....	1.960
18	4	1	....	....	1.795
9	3.5	..	....	....	1.395
13.5	4	3	....	....	2.060
13.75	3.75	2	5	....	2.440
6.4	4.5	1.9	....	5	1.300
6	4	3	....	6	1.545
1.5	4	1	....	8.5	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.68	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.25	9.00	11.07	55.98	8.50	8.80	11.00#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.10	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.10	52.43	8.54	8.92	11.06	14.86	9.18	8.93	10.21
Cleveland	8.18	9.45	10.20	52.33	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	7.50	8.80	....	....	7.65	7.60	11.01	....	9.00	9.45	10.70
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.43	9.70	10.45	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.10	8.40	8.45	54.32	7.25	7.20	11.10	13.50	7.25	8.05	9.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.45	9.40	12.00	57.60	8.90	8.75	12.10	16.10	8.70	8.85	11.00
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96#	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.23	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.45	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.66
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.00	8.90	9.92	52.69	8.70	8.65	11.51#	15.01	8.50	8.75	9.75**
Pittsburgh	8.18	9.45	10.45	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.71	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00#	16.00	9.50	9.60	12.00
Seattle	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **½ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [6]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrail, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Clearfield, Orviston, Snow Shoe, Pa., $305; Philadelphia, $310.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Clearfield, Orviston, Snow Shoe, Pa., $345; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60% $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River.	9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh).	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	

Aluminum: Atomized, 500-lb drum, freight allowed Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	30.30-45.70†
Bronze, 5000-lb lots	45.70-49.80†
Copper: Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	47.80-52.60†
Phosphor-Copper, 5000-lb lots	57.80
Copper (atomized) 5000-lb lots	38.30-46.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal; 1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.30	$5.30	$5.30	$5.50
Bar Size Angles	5.05	5.05	5.05	5.42
Structural Angles	5.05	5.05	5.05	5.42
I-Beams	5.11	5.11	5.11	5.45
Channels	5.11	5.11	5.11	5.45
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.07	6.07	6.07	6.43
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails ($)	8.02	8.02	7.92	8.20

†Per 82 lb. net reel. $Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68.5%	14.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$9.50-10.00
Domestic, concentrates f.o.b. milling points	17.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $134.40 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$46.00-48.00
48% 2.8:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

48% no ratio	$32.00-34.00
44% no ratio	24.00-25.00

Turkish

48% 3:1	$51.00-55.00

Domestic

Rail nearest seller

48% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.	

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245. Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 39.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, 8M x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ½" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c, less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots, $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lot $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

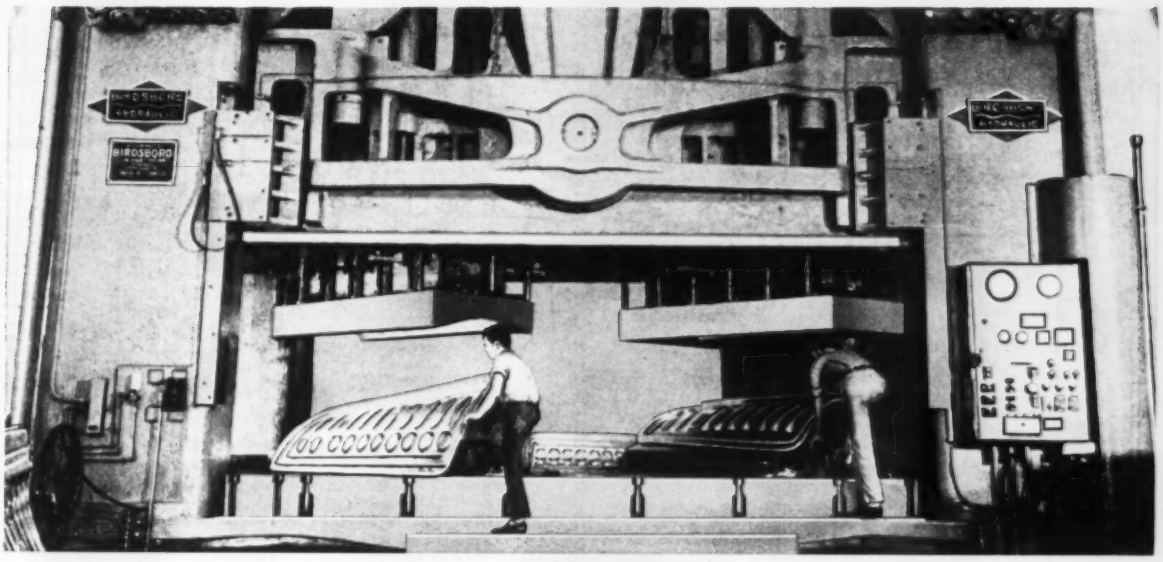
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

S'manal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c; less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.



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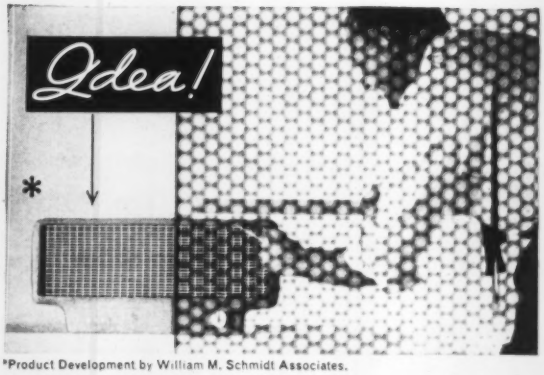

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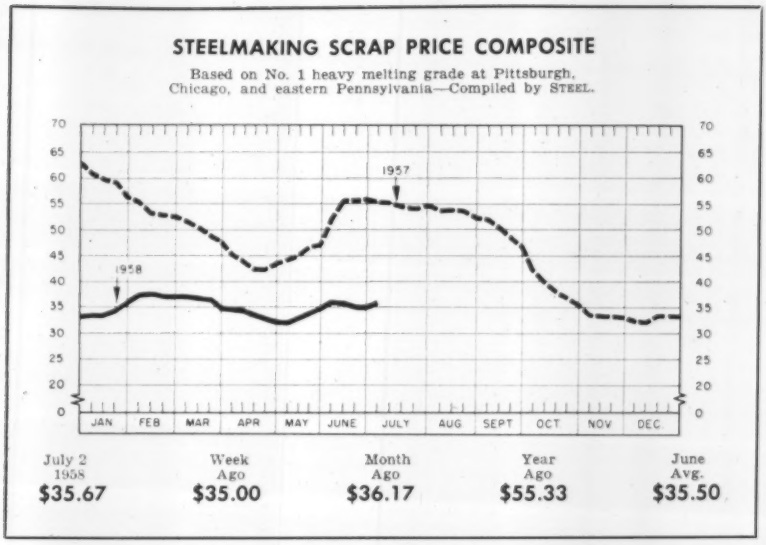
STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
July 2 1958 $35.67
Week Ago $35.00
Month Ago $36.17
Year Ago $55.33
June Avg. $35.50

Chicago Sale Boosts Scrap Index

Purchase of factory material at sharply higher price serves to inject a note of strength into a generally dull market. STEEL's composite rises 67 cents to $35.67

Scrap Prices, Page 116

Chicago — Reacting to prospects of improved steelmaking starting in August, the scrap market here has advanced about $2 a ton on all important grades. The upward movement started when No. 1 industrial bundles produced by local auto stamping plants sold for a little more than $44 a ton, delivered. The successful bids were $4 more than mills had last paid for that grade. Immediate result: Dealers tagged leading grades $2 to $3 a ton higher than quotations on recent sales.

Pittsburgh—Prices on the premium grades of scrap are unchanged in a listless market. Little tonnage is being purchased by the mills, and little is being generated.

Factory bundles offered by Fisher Body Div., General Motors Corp., reportedly were taken by one broker at $39.50. A month ago, three brokers paid $40.10-$40.75 for factory bundles, but they had difficulty disposing of them at a profit.

Philadelphia — Scrap trading is quiet, but no weakness is in evidence. Prices are unchanged. Stocks are relatively light at most yards, and the volume of manufactured scrap is limited, due in part to vacation influences.

New York—Steadiness dominates the local scrap market, with brokers' buying prices unchanged throughout the list. Both domestic and foreign requirements are light, but so are yard inventories.

Boston — Scrap shipments are light, with prices for steelmaking grades tied close to eastern Pennsylvania delivered prices. Export orders are down, and purchases for the Worcester open hearths, closing down July 26, have ceased. This steelworks normally takes around 100,000 tons of scrap annually.

Cleveland—Scrap dealers do not anticipate much market activity over the next several weeks. Vacation suspensions will hold down consumption and limit purchases. Expectations are prices will get some support from shrinking factory scrap generation. But no real test of the market is expected until later in the summer when automotive demands for steel should stimulate mill scrap requirements.

Detroit—Local scrap prices are nominal in the absence of new orders, but auto lists closed at about the same level as they were a month ago. The small tonnage involved helped keep prices up. Turnings are off slightly.

McNichols Scrap Iron & Metal Co., Detroit, announced a "put and call" method of handling industrial scrap covered on contracts. The company will pick up a seller's scrap and store it for a specified period with a minimum guarantee of $40 a ton to the seller during the

(*Please turn to Page* 122)

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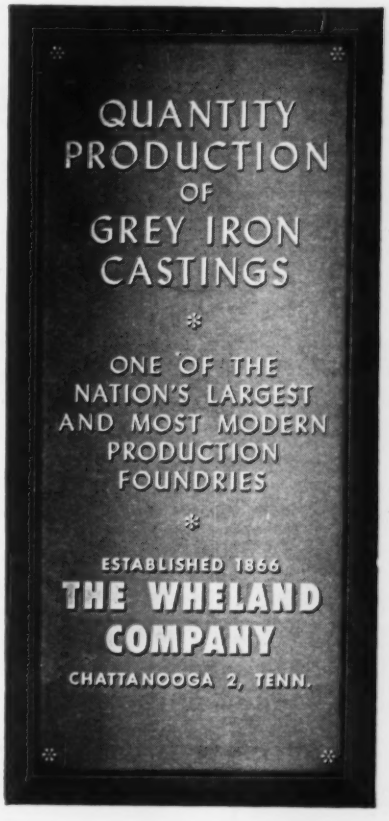
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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, July 2, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 2	$35.67
June 25	35.00
June Avg.	35.50
July 1957	54.67
July 1953	43.51

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	30.00-31.00
No. 1 dealer bundles	35.00-36.00
No. 2 bundles	25.00-26.00
No. 1 busheling	35.00-36.00
No. 1 factory bundles	40.00-41.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut structurals:	
2 ft and under	39.00-40.00
3 ft lengths	37.00-38.00
Heavy turnings	31.00-32.00
Punchings & plate scrap	40.00-41.00
Electric furnace bundles	37.00-38.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	39.00-40.00
Unstripped motor blocks	23.00-24.00
Clean auto cast	39.00-40.00
Drop broken machinery	48.00--49.00

Railroad Scrap

No. 1 R.R. heavy melt.	40.00-41.00
Rails, 2 ft and under	53.00-54.00
Rails, 18 in. and under	54.00-55.00
Random rails	50.00-51.00
Railroad specialties	44.00-45.00
Angles, splice bars	47.00-48.00
Rails, rerolling	55.00-56.00

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	100.00-105.00
430 bundles & solids	100.00-105.00
430 turnings	50.00-52.00

CHICAGO

No. 1 hvy melt., indus.	*38.00-39.00*
No. 1 hvy melt., dealer	*36.00-37.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 factory bundles	*41.00-42.00*
No. 1 dealer bundles	*37.00-38.00*
No. 2 bundles	*28.00-29.00*
No. 1 busheling, indus.	*38.00-39.00*
No. 1 busheling, dealer	*36.00-37.00*
Machine shop turnings	*19.00-20.00*
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*21.00-22.00*
Cut structurals, 3 ft	*43.00-44.00*
Punchings & plate scrap	*44.00-45.00*

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Stove plate	*39.00-40.00*
Unstripped motor blocks	*34.00-35.00*
Clean auto cast	*47.00-48.00*
Drop broken machinery	*47.00-48.00*

Railroad Scrap

No. 1 R. R. heavy melt.	*42.00-43.00*
R.A. malleable	*53.00-54.00*
Rails, 2 ft and under	*54.00-55.00*
Rails, 18 in. and under	*55.00-56.00*
Angles, splice bars	*49.00-50.00*
Axles	*60.00-61.00*
Rails, rerolling	*55.00-56.00*

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	95.00-100.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

YOUNGSTOWN

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	22.00-23.00
No. 1 busheling	36.00-37.00
No. 1 bundles	36.00-37.00
No. 2 bundles	21.00-22.00
Machine shop turnings	9.00-10.00
Short shovel turnings	13.00-14.00
Cast iron borings	13.00-14.00
Low phos.	34.00-35.00
Electric furnace bundles	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CLEVELAND

No. 1 heavy melting	32.50-33.50
No. 2 heavy melting	*22.00-23.00*
No. 1 factory bundles	*36.00-37.00*
No. 1 bundles	32.50-33.50
No. 2 bundles	20.00-21.00
No. 1 busheling	32.50-33.50
Machine shop turnings	7.00-8.00
Short shovel turnings	11.00-12.00
Mixed borings, turnings	11.00-12.00
Cast iron borings	11.00-12.00
Cut foundry steel	37.00-38.00
Cut structurals, plates 2 ft and under	39.00-40.00
Low phos, punchings & plate	30.00-31.00
Alloy free, short shovel turnings	16.00-17.00
Electric furnace bundles	33.50-34.50

Cast Iron Grades

No. 1 cupola	42.00-43.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Stove plate	43.00-44.00
Unstripped motor blocks	25.00-26.00
Brake shoes	33.00-34.00
Clean auto cast	42.00-43.00
Burnt cast	30.00-31.00
Drop broken machinery	47.00-48.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	49.00-50.00
Cast steel	44.00-45.00
Railroad specialties	47.00-48.00
Uncut tires	40.00-41.00
Angles, splice bars	46.00-47.00
Rails, rerolling	51.00-52.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	30.00
No. 1 bundles	34.00
No. 2 bundles	23.00
No. 1 busheling	33.00
Machine shop turnings	16.00†
Short shovel turnings	18.00†

Cast Iron Grades

No. 1 cupola	41.00
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	34.00
Clean auto cast	44.00
Stove plate	40.00

Railroad Scrap

No. 1 R.R. heavy melt.	*36.50*
Rails, 18 in. and under	48.00
Rails, random lengths	45.50
Rails, rerolling	55.00
Angles, splice bars	*45.00*

BIRMINGHAM

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
No. 1 busheling	30.00-31.00
Cast iron borings	12.00-13.00
Machine shop turnings	20.00-21.00
Short shovel turnings	21.00-22.00
Bars crops and plates	*39.00-40.00*
Structurals & plates	*38.00-39.00*
Electric furnace bundles	34.00-35.00
Electric furnace:	
2 ft and under	33.00-34.00
3 ft and under	32.00-33.00

Cast Iron Grades

No. 1 cupola	*51.00-52.00*
Stove plate	49.00-50.00
Unstripped motor blocks	*39.00-40.00*
Charging box cast	22.00-23.00
No. 1 wheels	*35.00-36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18 in. and under	46.00-47.00
Rails, rerolling	*53.00-54.00*
Rails, random lengths	42.00-43.00
Angles, splice bars	*40.00-41.00*

PHILADELPHIA

No. 1 heavy melting	34.00
No. 2 heavy melting	30.00
No. 1 bundles	34.00
No. 2 bundles	24.00
No. 1 bunsheling	34.00
Electric furnace bundles	36.00
Mixed borings, turnings	16.00†
Short shovel turnings	18.00
Machine shop turnings	15.00
Heavy turnings	29.00
Structural & plate	39.00-40.00
Couplers, springs, wheels	43.50
Rail crops, 2 ft & under	55.00-56.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	40.00
Malleable	58.00-59.00†
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	16.00-17.00
Machine shop turnings	8.00-9.00†
Mixed borings, turnings	9.00-10.00†
Short shovel turnings	11.00-12.00†
Low phos (structurals & plates)	33.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	155.00-160.00
18-8 borings, turnings	50.00-55.00
410 sheets, clips solids	50.00-55.00
430 sheets, clips, solids	60.00-65.00

BUFFALO

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	22.00-23.00
No. 1 bundles	26.00-27.00
No. 2 bundles	20.00-21.00
No. 1 busheling	26.00-27.00
Mixed borings, turnings	13.00-14.00
Machine shop turnings	10.00-11.00
Short shovel turnings	14.00-15.00
Cast iron borings	13.00-14.00
Low phos. structurals and plate, 5 ft and under	31.00-32.00
2 ft and under	35.00-36.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	35.00-36.00

CINCINNATI

(Buyers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	34.00-35.00
No. 2 bundles	*23.00-24.00*
No. 1 busheling	34.00-35.00
Machine shop turnings	11.50-12.50
Mixed borings, turnings	11.50-12.50
Short shovel turnings	13.50-14.50
Cast iron borings	11.50-12.50
Low phos. 18 in.	39.00-40.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Heavy breakable cast	32.00-33.00
Charging box cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	43.00-44.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	32.00
No. 2 bundles	21.00†
Machine shop turnings	14.00
Short shovel turnings	17.00
Low phos. plates, structurals	36.00

Cast Iron Grades

No. 1 cupola	40.00
Heavy breakable	30.00†
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	22.00-23.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	22.00-23.00
No. 2 bundles	14.00-15.00
No. 1 busheling	22.00-23.00
Machine shop turnings	5.00-6.00
Mixed borings, turnings	5.00-6.00
Short shovel turnings	7.00-8.00
No. 1 cast	28.00-29.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	31.00-32.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	19.00-21.00
No. 1 bundles	27.00-28.00
No. 2 bundles	18.00-19.00
No. 1 busheling	26.00-27.00
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	10.00-11.00
Punchings & plate	31.00-32.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Stove plate	27.00-28.00
Charging box cast	26.00-27.00
Heavy breakable	24.00-25.00
Unstripped motor blocks	14.00-15.00
Clean auto cast	35.00-36.00

SEATTLE

No. 1 heavy melting	*31.00*
No. 2 heavy melting	*29.00*
No. 1 bundles	*23.00*
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	28.00
No. 2 bundles	20.00
Machine shop turnings	11.00
Shoveling turnings	11.00
Cast iron borings	11.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory: Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	45.00-50.00

†Nominal.
‡F.o.b. Hamilton, Ont.

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58-209

Minerals Bill up for Vote

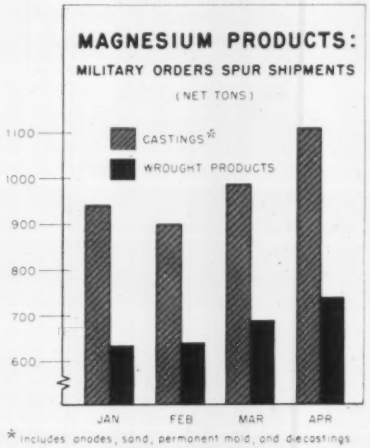
Senate Interior Committee recommends adoption of modified Seaton bill to aid five metals. Early Senate passage is expected. House approval is less certain

Nonferrous Metal Prices, Pages 120 & 121

THE NEXT few weeks should tell whether the domestic mining industry will get help from Congress. Last week, the Senate Interior & Insular Affairs Committee reported out a revised bill based on Interior Secretary Seaton's minerals stabilization program. (See Page 42.)

Major Provisions—They generally follow the administration plan. Changes include new price supports for lead, zinc, and fluorspar, plus the granting of borrowing authority to the secretary of the interior. If passed, the bill would provide:

- A copper stockpile program that would take 150,000 tons of domestically mined metal over one year. Price: Up to 27.5 cents a pound.
- Subsidy payments on lead and zinc of up to 4 cents a pound to make up the difference between the market price and a stabilized price of 15.5 cents a pound for lead and 13.5 cents a pound for zinc. In addition, bonus payments would be made on the first 500 tons of lead and zinc sold in each quarter per producer. The committee went along with Mr. Seaton's recommendations on the amount of metal that would be eligible for support payments annually under the five-year program: 550,000 tons of zinc, 350,000 tons of lead.
- Payments of up to $8 a ton for acid grade fluorspar, the actual amount to be based on the differential between the sale price and a stabilized price of $53 a ton. (Secretary Seaton had recommended $48 a ton.) Payments would be limited to sales of 180,000 tons annually for five years.
- A subsidy payment on tungsten not to exceed $18 a short ton unit. Payments would be based on the spread between the market price and a stabilized price of $36 a short ton unit and would be made on a maximum of 375,000 short ton units annually. Recommendations call for an additional bonus of $4 a unit to producers who sell less than 250 units in any one quarter.
- Authority for the interior secretary to borrow up to $350 million to finance the five-year program.



*Includes anodes, sand, permanent mold, and diecastings
Source: Magnesium Association

Left Out—The committee refused to incorporate into the bill: 1. A proposal for a lead-zinc stockpile program similar to the one for copper. 2. A stockpile or subsidy program for aluminum. 3. The addition of metallic grade fluorspar, mercury, cobalt, and antimony to the support program.

The consensus is it will get through the Senate without too much trouble, probably soon. The real test will come in the House. Congressional proponents are hopeful they can muster enough strength to push the bill through despite a hard core of opposition but admit it won't be easy. One of the reasons the Senate committee refused to recommend stockpiling of lead and zinc and the inclusion of aluminum was to make the bill more palatable to certain segments of the House, Washington sources say.

Added help for copper came last week in the form of Congressional inaction: Congress failed to vote on a bill suspending the excise tax—1.7 cents a pound (as of July 1) on imports of ore and metal. Certain mill products will get increased duties based on their copper content. It's still possible the tariff will be suspended. But don't look for any action along this line until after Congress acts on the minerals bill, say Washington observers.

Progress on Barter—Chances for a stepped-up lead and zinc barter program were temporarily killed on June 26 when the House voted down the Omnibus Farm Bill. Tacked onto it were barter provisions that would: 1. Prohibit the secretary of agriculture from limiting areas where barter contracts could be made. 2. Authorize the processing in the U. S. of foreign origin lead and zinc ores.

Congressional sources say the barter provisions will probably be presented as a separate bill in this session of Congress. A Washington observer says the bill would get strong support in the House and would probably pass the Senate (where an earlier bill was defeated by only 3 votes).

NONFERROUS PRICE RECORD

	Price July 1	Last Change	Previous Price	May Avg	Apr. Avg	June, 1957 Avg
Aluminum	24.00	Apr. 1, 1958	26.00	24.000	24.000	27.100
Copper	25.00-26.50	June 17, 1958	25.00-26.00	24.433	24.323	30.250
Lead	11.30	June 18, 1958	10.80	11.512	11.800	14.120
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	94.125	July 1, 1958	94.50	94.510	93.021	98.080
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	10.840

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

BRIDGEPORT BRASS
COPPER ALLOY BULLETIN

Reporting New Developments in Copper-Brass Alloys and Metalworking Methods

The Hankison Condensifilter in which the tubed condenser (left above) is installed.

HOW COPPER BENDS TO THE TASK OF SQUEEZING IMPURITIES OUT OF AIR

Here is a remarkable example of the outstanding *natural* qualities of copper tube—its ability to bend easily, resist corrosion and transfer heat. The Hankison Corporation, Canonsburg, Pa. makes a compressed air Condensifilter, in which they have used $\frac{3}{8}$" Bridgeport copper tube in an amazingly compact and efficient condensing unit.

Over 66 feet of the tube is formed into a series of hairpin bends to provide more than 900 square inches of heat exchange area. The unit in which the tube is used is the heart of the Condensifilter. In service, air coming from the compresser passes through this condenser. Cooling water, circulated through the tube, cools the air and causes moisture and oil vapors to condense out of the air stream. The very function of the unit exposes it to corrosive condensate. Copper's natural corrosion resistance, coupled with its workability, makes it virtually the only metal that can do this job so well.

Bridgeport copper and brass alloys lend themselves to many applications that many other metals cannot fill. Their workability, economical cost, resistance to corrosion, and long operating life are important advantages.

To learn more about Bridgeport metals and what they can do for you, call your Bridgeport Salesman. Backed by Bridgeport's Technical Service, he can give you valuable assistance in selecting the metal best suited to your product and production process.

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Today, brass is competitively priced. Everyone can now afford to put superior quality into their finished product by making use of the many advantages only brass can offer. Here are the benefits Bridgeport Alloys give you.

Higher quality—Strip with exceptionally fine surface and close tolerances is produced by our newly installed Sendzimir mills.

Lower finishing cost—The inherent beauty, lustre, and color of solid brass are far superior to those of other materials.

Scrap value—The value of brass scrap is an important factor in *final* metal costs. It offers a more advantageous return than steel or stainless.

Easier fabrication—The excellent machinability of brass means higher production rates and longer tool life.

Bridgeport's Technical Service is always ready to show you how brass can do a better job than the metals you are now using. Take advantage of the superiority of brass—call your nearest Bridgeport Sales Office.

BRIDGEPORT BRASS

Bridgeport Brass Company, Bridgeport 2, Connecticut • Offices in Principal Cities
In Canada: Noranda Copper and Brass Limited, Montreal

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.00; ingots, 26.10, 30,000 labor more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 27.90; No. 43, 27.70; No. 195, 28.70; No. 214, 29.50; No. 356, 27.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 25.00-26.50 deld.; custom smelters, 25.50; lake, 25.00-26.50 deld.; fire refined, 24.75-26.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 11.30; chemical, 11.40; corroding, 11.40, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $228-230 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $62-70 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market 88.625 per troy oz.

Sodium: 17.00, c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 94.125.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), 2.05; grade A-2 (0.5% Fe max.), $1.85 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.00; special high grade, 11.25 deld. Diecasting alloy ingot No. 3, 12.75; No. 2, 13.25; No. 5, 13.00 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 22.50-24.00; No. 12 foundry alloy (No. 2 grade), 21.25-21.50; 5% silicon alloy, 0.60 Cu max., 24.00-24.25; 13 alloy 0.60 Cu max., 24.00-24.25; 195 alloy, 24.25-25.50; 108 alloy, 21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.25; grade 2, 21.25; grade 3, 20.00; grade 4, 17.25.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze, No. 225, 36.00; No. 245, 30.75; high-leaded tin bronze, No. 305, 31.25; No. 1 yellow, No. 405, 22.75; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Template, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $16.00 per cwt; pipe, full coils, $16.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-11.00; forging billets, $4.10-4.35; hot-rolled and forged bars, $5.25-6.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H. R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.136	41.10-45.60	.....
0.135-0.096	41.60-46.70	.....
0.125-0.096	.....	38.50-39.10
0.095-0.077	42.30-48.50	38.60-39.30
0.076-0.061	42.90-50.80	38.80-40.00
0.060-0.048	43.60-53.10	39.40-41.10
0.047-0.038	44.20-55.90	39.90-32.50
0.037-0.030	44.60-60.90	40.30-44.30
0.029-0.024	45.20-52.70	40.60-45.00
0.023-0.019	46.20-56.10	41.70-43.40
0.018-0.017	47.00-53.40	42.30-44.00
0.016-0.015	47.90-54.30	43.10-44.80
0.014	48.90	44.10-45.80
0.013-0.012	50.10	44.80
0.011	51.10	46.00
0.010-0.009	52.60	47.40
0.009-0.0095	53.90	48.90
0.008-0.0075	55.50	50.10
0.007	57.00	51.60
0.006	58.60	53.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	41.70	46.50
5050-F	42.80	47.60
3004-F	43.80	49.50
5052-F	44.40	50.20
6061-T6	44.90	51.00
2024-T4	48.60	55.40
7075-T6*	56.40	64.00

*24-48 in. width or diam., 72-180 in. lengths.

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10, .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 19.75-20.25; No. 2 heavy copper and wire, 18.00-18.50; light copper, 16.00-16.50; No. 1 composition turnings, 15.00-15.50; new brass clippings, 13.50-14.00; light brass, 9.50-10.00; heavy yellow brass, 11.00-11.50; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 12.00-12.50; cocks and faucets, 13.00-13.50; brass pipe, 13.00-13.50.

Lead: Heavy, 7.25-7.50; battery plates, 3.00-3.25; linotype and stereotype, 9.25-9.75; electrotype, 7.50-8.00; mixed babbitt, 9.00-9.50.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 9.50-10.00; clean borings and turnings 6.00-6.50; segregated low copper clips 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 13.00-14.00; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 9.00-9.50; clean borings and turnings, 8.00-8.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 14.00-14.50; mixed high copper clips, 12.50-13.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 9.00-9.50; clean borings and turnings, 8.00-8.50; segregated low copper clips, 12.50-13.00; segregated high copper clips, 11.00-11.50; mixed low copper clips, 11.50-12.00; mixed high copper clips, 10.50-11.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire,

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 25.00c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13b	45.63c	....	48.32	21.000	21.000	20.250
Yellow Brass	42.69	29.53d	43.23	45.60	16.125	15.875	14.500
Low Brass, 80%	44.90	44.84	45.44	47.71	17.875	17.625	17.125
Red Brass, 85%	45.67	45.61	46.21	48.48	18.625	18.375	17.875
Com. Bronze, 90%	46.98	46.92	47.52	49.54	19.250	19.000	18.500
Manganese Bronze	50.81	44.91	55.44	....	14.875	14.625	14.125
Muntz Metal	45.19	41.00	....	....	15.125	14.875	14.375
Naval Brass	47.07	41.38	54.13	50.48	14.875	14.625	14.125
Silicon Bronze	52.84	52.03	52.88	54.77	20.625	20.375	19.625
Nickel Silver, 10%	57.93	60.26	60.26	....	21.125	20.875	10.562
Phos. Bronze, A-5%	67.17	67.67	67.67	68.85	21.875	21.625	20.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

20.50; light copper, 18.25; refinery brass (60% copper) per dry copper content, 20.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire, 20.50; light copper, 18.25; No. 1 composition borings, 19.00; No. 1 composition solids, 19.50; heavy yellow brass solids, 13.50; yellow brass turnings, 12.50; radiators, 15.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70.

Copper: Flat-rolled, 41.79; oval, 40.00, 5000-10,000 lb; electrodeposited, 35.25, 2000-5000 lb lots; cast, 37.75, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 113.50; 200-499 lb, 112.00; 500-999 lb, 111.50; 1000 lb or more, 111.00.

Zinc: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 200 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.90; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-999 lb, 43.50; 10,000 lb or more, 40.50.

Nickel Sulphate: 5000-22,000 lb, 29.00; 23,000-35,900 lb, 28.50; 36,000 lb or more, 28.00.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 75.80; 100-600 lb, 66.80; 700-1900 lb, 64.00; 2000-9900 lb, 62.20; 10,000 lb or more, 60.80.

Stannous Chloride (anhydrous): 10 lb, 100.757; 25 lb, 100.507; 100 lb, 100.459; 400 lb, 100.434; 800-19,900 lb, 100.026; 20,000 lb or more, 96.50.

Stannous Sulphate: Less than 50 lb, 100.361; 50 lb, 100.061; 100-1900 lb, 100.041; 2000 lb or more, 100.021.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

SUPERINTENDENT

For Large, Well Established, Structural Steel Fabricating Plant in Pittsburgh Area

- Excellent salary and fringe benefits.
- Must have successful background in running steel fabricating shop. Excellent opportunity for advancement for man with ability and ambition.
- Write fully, giving age, education and employment background.

All replies confidential.

Reply Box 675, STEEL

Penton Building Cleveland 13, Ohio

WANTED

Personnel experienced in Structural Steel Fabrication.

Must have shop management background and production know-how to qualify for growth situation.

Replies will be held confidential.

Write Box 674, STEEL

Penton Bldg. Cleveland 13, Ohio

BRIDGE CRANES

2-150 Ton P&H (2-75 Ton trolleys & 2-10 ton auxiliaries) Span—74'8", Clearance Rail to truss bottom—11'6", 250 DC

1-50 Ton NILES (2-25 ton trolleys & 1-5 ton auxiliary) Span—76', Clearance—Rail to truss bottom—8', 250 DC

Conditions: Where Is, As Is

EDDYSTONE DIVISION, BALDWIN-LIMA-HAMILTON

Philadelphia 42, Pa.

Contact: H. L. NEWLIN Phone: SAratoga 6-9300

GET CASH NOW

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AVAILABLE: NEW MOTORS

Over 5,000 new motors in stock from 1 HP to 200 HP. Special low prices.

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Nation's Largest Warehouse Stocks

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Lindberg Combustion Tube Laboratory Furnaces

Late Type: CF-2

Specially Priced: $250 Ea.

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ADAMS MACHINERY COMPANY

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SALES MANAGER-ENGINEER

for industrial steel warehouse in Southern City of 500,000 population. Products handled consist of hot rolled bars, structurals, plates, sheets, cold rolled bars, reinforcing mesh, grating and includes stainless steel, aluminum and allied products as well as a complete warehouse service. Must be capable of reading plans and have experience in engineering. Logical distribution area is surrounding radius of 350 miles. We are interested only if you are experienced in steel warehouse sales, completely capable of supervising outside and inside salesmen and if you are aggressive "pusher" type. Excellent opportunity for the right man. If to accept this position you must leave your present job, give full details why you wish to leave. All replies held in strictest confidence. Please do not apply unless you completely fill qualifications. **Write Box 671, STEEL Penton Bldg. Cleveland 13, Ohio**

ASSISTANT PLANT MANAGER

Unusual opportunity for experienced production man at new metals reduction plant currently producing zirconium and titanium sponge.

10 to 15 years experience in responsible supervisory capacity in either chemical or metallurgical industry required.

The man we are seeking should have proven ability to keep production and maintenance costs at a minimum and must be capable of working with a top technical team of graduate engineers.

Plant location at Ashtabula, Ohio, provides desirable living in progressive small community.

Full information covering experience, education and present salary should accompany first application. All replies will be held in strict confidence and no references contacted without prior permission of applicant.

Address replies to:

Personnel Department

MALLORY-SHARON METALS CORP.

99 Park Avenue

New York 16, New York

CLASSIFIED

Representatives Wanted

WANTED: Manufacturers' Representative in Michigan area to sell established line of periodic and continuous electric furnaces and kilns to metalworking and ceramic industries. Technical industrial heating background desirable. Complementary lines acceptable. Write Harper Electric Furnace Corporation, 110 Pearl Street, Buffalo 2, New York.

Help Wanted

MILL REPRESENTATIVES or agents wanted for new steel tube mill. Several available territories. Write Box 84, Sheffield, Alabama.

For steel rolling mill in Eastern United States. Experience in small shapes required. State age, experience and salary expected to Box 673, STEEL, Penton Bldg., Cleveland 13, Ohio.

To cut costs with conveyors

Ask Standard

Starting at the molding machines, a complete Standard conveyor system, with transfer cars, is used to move flasks and molds to pouring and storage area, with return lines for empty flasks.

Step up core making production with low-cost roller conveyors

Foundries are finding new savings in production with Standard's low-cost gravity conveyors. One user of national repute states these conveyors have "worked out just fine" for making and handling cores, before and through the oven.

Heavy-duty Standard foundry roller conveyors equipped with shielded bearings make possible smooth, efficient handling of molds and flasks.

Standard offers specialized experience of more than 50 years of designing and building foundry and mill conveyors. For any conveyor need, contact STANDARD CONVEYOR COMPANY, General Offices: North St. Paul 9, Minnesota.

Left: simple, low-cost Standard gravity conveyors speed core making and handling, before and through oven. *Right*: roller conveyors carry molds to the pouring floor.

Send for Standard's special catalog — a valuable reference book illustrating and describing various conveyor installations in leading foundries. Ask for Bulletin 68 — address Dept. Y-7.

Standard GRAVITY & POWER CONVEYORS

OVER 50 years of conveyor experience

Sales and Service in Principal Cities

(*Concluded from Page 115*)

period. The seller has the option of selling at the current price during the holding period, or he can wait for the minimum price to be reached. The system is said to afford a ready market for customer scrap and acts as a hedge on the market.

Buffalo — Scrap dealers expect little business in mill or foundry grades during July. The mills have reduced operations and will use less scrap than they did in June. Foundries are closed for vacations.

Cincinnati—The scrap market is a little stronger. Prices have regained some of the losses suffered recently. District mills entered the market at the start of the month, placing orders at about month-ago price levels. No. 2 heavy melting gained 50 cents, rising to $28-$29. No. 2 bundles, at $23-$24, advanced $1 a ton.

St. Louis—Although demand continues slow, the scrap market here shows signs of new strength on railroad offerings. The B.&O., New York Central, and Pennsylvania lists will show soon whether the market is really firming up. These offerings will not be made in the immediate St. Louis district, but they will be reflected in that market.

Birmingham—Limited buying for electric furnaces and foundries at higher prices indicates the scrap market is stronger here. But some dealers think prices will hold through July at about the June level.

Houston—Scrap prices are unchanged. Mill inventories are heavy, despite good operations in June. Production will slide off this month.

Seattle—A smaller volume of sales to mills is expected this month due to slackened steelmaking operations as producers curtail for vacations. One dealer here quotes for July No. 1 heavy melting at $31, No. 2 at $29, and No. 1 bundles at $23.

San Francisco—Steel scrap prices are unchanged here. The market is slow, and there is little prospect of a pickup in demand this month.

Los Angeles—Absence of buying precludes a test of the scrap market. Despite higher steel operations in June, the mills have bought little scrap.

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RED CIRCLE Rolls ALLOY-CHILLED

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Rolling Mill Equipment

For more than 50 years Hyde Park Steel Mill equipment has been helping American industry lead the world — equipment such as—

- Bar Mills
- Merchant Mills
- Sheet and Strip Mills
- Pinion Stands
- Roller Tables
- Reduction Drives
- Stretcher Levellers
- Guillotine Shears
- Sheet Mill Shears
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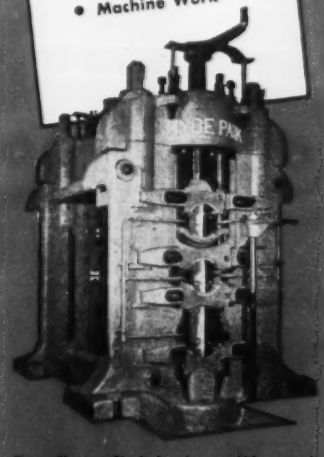
- Machine Work



For finer finish, long life and greater tonnage, specify Red Circle Rolls.

Hyde Park

FOUNDRY & MACHINE CO.

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ROLLING MILL MACHINERY

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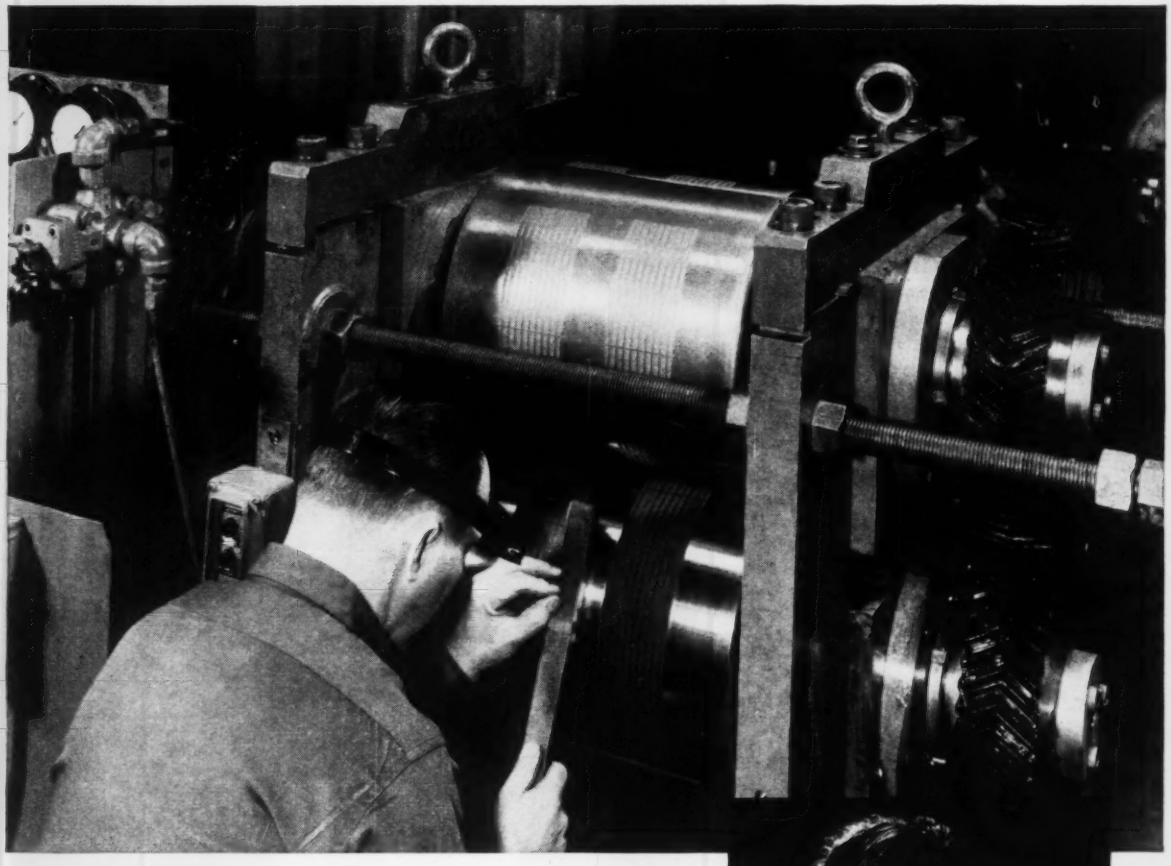


"Quality perfection is our business —Standard Steel helps us maintain it—and more"

Alclyde Engraving is in a fascinating business. Chances are the dashboard trim, instrument panels, and scuff plates on your car were embossed on Alclyde rolls—this firm manufactures the major part of all rotary register embossing rolls used by the automotive industry.

The packaging, labeling and plastics industries are also heavy users of Standard-forged, Alclyde-engraved rolls. And in all fields in which design changes are a frequent and vital competitive factor, Alclyde must deliver perfection in a hurry.

That's why we at Standard have geared ourselves to give Alclyde the quality perfection and service it requires. In fact, it's the *service* we can give that all of our customers particularly appreciate. Won't you discuss your quality *and* service requirements with us? Write Dept. 2-G.

"Yes, Standard Steel Works, in supplying us with matched, flame-hardened forged steel embossing rolls, meets our rigid specifications for steel analysis and accurate machining. Nothing is more vital to an engraver than to have perfection all along the line. But in addition, we appreciate the warm, personal relationship which exists between us. The people at Standard appear to be really interested in our business and problems," says Frank W. Broderick, president Alclyde Engraving Co., Chatham, N. J.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

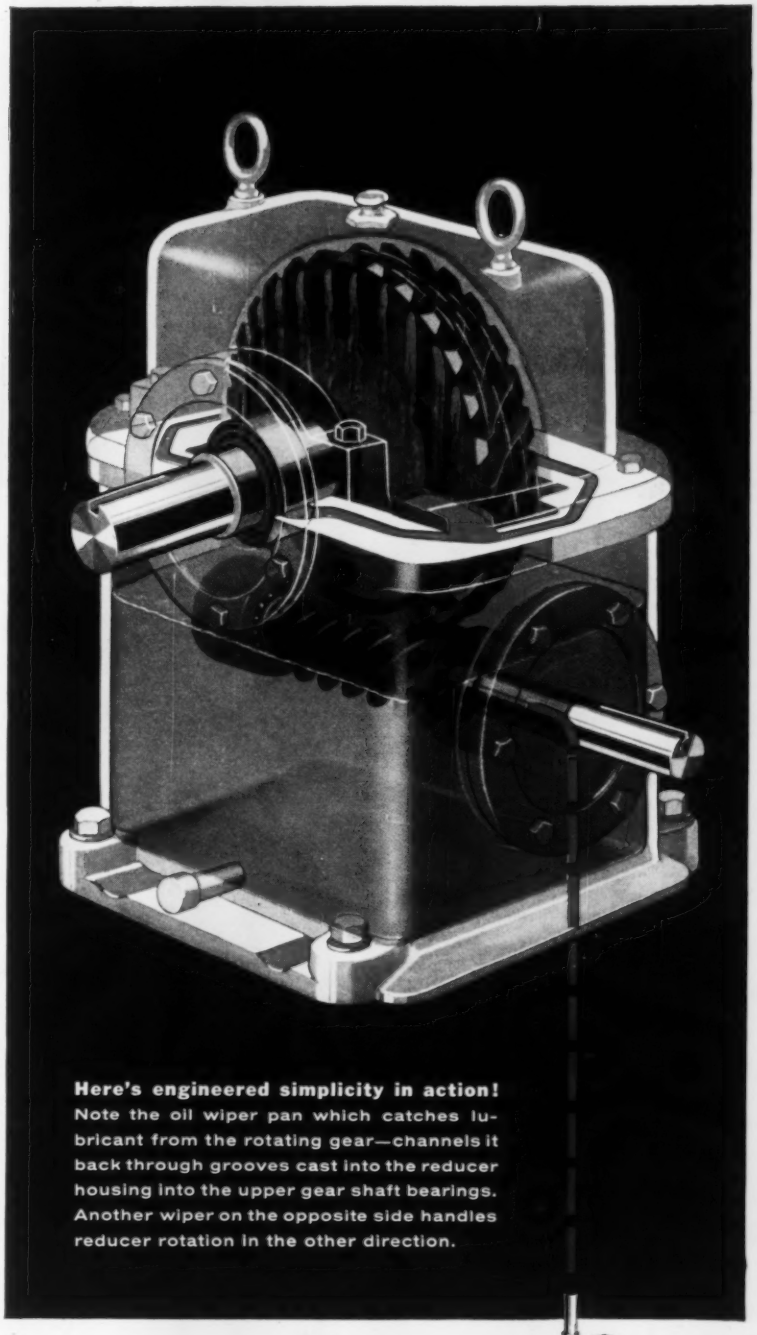
BALDWIN BLH LIMA-HAMILTON

Automatic, built-in lubrication helps give Clevelands their long service life

Here's one reason why many Cleveland Worm Gear Speed Reducers have provided trouble-free operation day in-day out for over 42 years.

The secret is continuing, adequate lubrication of Cleveland's case-hardened steel worms meshing with low-friction bronze gears. If reservoir is kept filled with good, clean oil, lubrication can never fail.

To get the complete "Cleveland Story", ask for your free copy of our new Bulletin 145. The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.



Here's engineered simplicity in action! Note the oil wiper pan which catches lubricant from the rotating gear—channels it back through grooves cast into the reducer housing into the upper gear shaft bearings. Another wiper on the opposite side handles reducer rotation in the other direction.

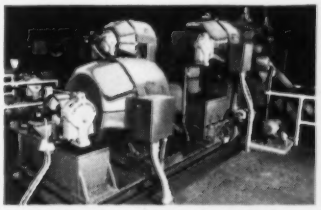
CLEVELAND
Worm Gear
Speed Reducers

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

The Cutler-Hammer engineered D-c adjustable voltage control system provides precise, dependable speed control of the continuous steel ribbon from entry to exit in the world's fastest cleaning and annealing line.

Cutler-Hammer operator's control station at the entry end of the line.

Cutler-Hammer Unitrol provides a convenient, space-saving unit for all A-c auxiliary controls.



Cutler-Hammer 505 Mill Brakes are used on the winding reels and bridle stands.

Cutler-Hammer operator's control station at the exit end of the line.

Behind the scenes at Weirton Steel...

Cutler-Hammer Control keeps the world's fastest continuous cleaning and annealing line on the go

The new continuous strip steel cleaning and annealing line at the Weirton Steel Company division of National Steel Corporation is truly a remarkable engineering achievement. It automatically cleans and anneals an endless ribbon of cold rolled steel at speeds up to 2,000 feet per minute . . . a new world's record. But of equal importance is the fact it can deliver 20,000 tons of steel ready for tin plating every month.

Unquestionably, a processing line such as this represents a major capital investment which must pay for itself through high speed, dependable production day after day . . . month after month . . . year after year. And to a great extent its successful operation depends upon the trouble-free performance of the control equipment which integrates and regulates the complex system of individual machines that go to make up the line. Here Cutler-Hammer's 65 years of control engineering experience provided the expert "know-how" in designing the *right* control system, the *dependable* control system for this performance champion.

You too will find it pays to work with Cutler-Hammer for the practical solution to all your control problems involving mill machines and processes. CUTLER-HAMMER Inc. 1211 St. Paul Ave., Milwaukee 1, Wis.

CUTLER·HAMMER
CONTROL
C-H

LOOK TO CUTLER-HAMMER MILL EXPERIENCE...AS BROAD AS IT IS LONG

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Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation, Inc.